SOCIAL SCIENCES

Public Health Reports

VOLUME 59 MAY 5, 1944 NUMBER 18

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Public Health Reports

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AIRPLANE DUSTING WITH PARIS GREEN FOR CONTROL OF *ANOPHELES QUADRIMACULATUS* SAY IN WATER-CHESTNUT COVERED AREAS OF THE POTOMAC RIVER DURING 1943

By WILLIAM C. MURRAY, *Passed Assistant Engineer (R)*, and HERBERT KNUTSON, *Assistant Sanitarian (R)*, *United States Public Health Service* [1]

Water chestnut (*Trapa natans* L.), a fresh-water plant native of Eurasia, was first observed in the Potomac River in 1919. It spread so rapidly that by 1940 it partially or completely covered every bay or cove along the Potomac from Washington, D. C., to Quantico, Va. The characteristic matlike growth of this plant not only greatly binders navigation but it produces ideal breeding conditions for the principal malaria vector in this region, *Anopheles quadrimaculatus* Say.

In 1940 the United States Engineer Department began cutting the water chestnut, and by the end of 1942 it had been eliminated from many areas in the northern section of the river. This work is part of a long-range program, and complete eradication of the plant cannot be expected for several years.

Because of the proximity of river areas covered by water chestnut to several military establishments (fig. 1), malaria mosquito-control measures were initiated in 1942 by the Office of Malaria Control in War Areas, United States Public Health Service, in cooperation with the health departments of Maryland, Virginia, and the District of Columbia. Airplane-engine-propelled boats, used to apply larvicidal dust to the breeding areas at the start of the 1942 season, proved inadequate because of the extensiveness of the areas and mechanical

[1] Office of Malaria Control in War Areas. The authors desire to acknowledge the advice and assistance given by Senior Entomologist (R) G. H. Bradley and Sanitary Engineer (R) Nelson H. Rector, U. S. Public Health Service, in the planning and prosecution of this work. Further acknowledgment is made of the cooperation given at all times by post commanders and by medical and sanitary officers of the Army, Navy, and U. S. Public Health Service District 2, and health department officials of Maryland, Virginia, and the District of Columbia. Appreciation is expressed to the officials of the Quantico Marine Barracks for use of airport facilities and to the Engineer Board, Fort Belvoir, for the servicing and care of boats. Special mention should be made of the skillful and dependable work of the airplane pilots, Messrs. W. H. Da Camara and N. E. Daughady.

MALARIA CONTROL IN WAR AREAS
U.S. PUBLIC HEALTH SERVICE
WATER CHESTNUT AREAS IN POTOMAC RIVER
DURING 1943
NAUTICAL MILES
LEGEND
FORT WASHINGTON
FORT BELVOIR
MARYLAND
VIRGINIA
QUANTICO
POTOMAC
RIVER
MOUNT VERNON
MASON NECK
KOAN
HEAD

FIGURE 1.

difficulties encountered in the operation of the boats. Therefore airplane dusting was resorted to as the most practical method by which control might be attained. The results of airplane dusting during 1942 were such as to recommend its continued use during 1943.

During 1943 water chestnut was first noted about May 17 and reached maximum growth during early July. Anopheline breeding was general over all the water-chestnut areas but was most prevalent where medium-sized plants predominated. In a few areas duckweed (*Lemna* sp.) invaded the water chestnut late in the season and was noted to decrease breeding. By early August the water chestnut had started to decrease, and it had nearly disappeared by mid-September.

OPERATIONS

The engineering and operational phases of the airplane-dusting program for 1943 were under the direction of the senior author. Actual dusting operations were performed by a commercial dusting company on an hourly basis. Turner Field, a United States Marine Corps flying field at Quantico, Va., was used as the base of operations.

Two Stearman biplanes, each equipped with a hopper having a capacity of 600 pounds of insecticide mixture, were used for the work. The quantity of larvicide released was regulated by a lever located in the cockpit which controlled the size of the opening in the bottom of the hopper. When wide open, approximately 4½ pounds of mixture (1 pound of paris green) was released per acre with a plane speed of 70 miles per hour. Uniform feeding of the larvicide through the opening was obtained by the action of an agitator which consisted of a rotating wire located in the lower half of the hopper and operated by a wind-propelled fan fitted to a reduction gear. The action of the agitator also prevented any caking of the larvicide.

The planes dusted at an approximate elevation of 15 feet and at a speed of 70 miles per hour (fig. 2). No dusting operations were undertaken when the wind velocity exceeded 6 miles per hour, since higher wind velocities caused too much drift, particularly in open areas. Heavy, overcast weather, with accompanying low wind velocities, proved the best for dusting, under which conditions a clearly defined swath of approximately 40 feet, with very little drift, was obtained. On clear days several hours in midday were accompanied by wind velocities too high for dusting. All dusting was done after the disappearance of early morning dew except in those instances where vegetation protruded only a fraction of an inch above the water level. In these latter cases, the presence of dew did not decrease the effectiveness of the larvicide. In cases where the vegetation extended several inches above the water, the plane flew at very low altitudes, from 8 to 10 feet, and literally blew the dust under the vegetation. This

proved very effective in Piscataway Creek, where plant growth was most luxuriant.

The insecticidal dust used was paris green mixed with soapstone as a diluent in a 1:4 ratio by volume. The ingredients were mixed in a hand-operated cylindrical mixer, placed in bags of 75-pound capacity, and stored in a dry warehouse adjacent to the flying field.

The maximum acreage of water chestnut in the areas under control adjacent to the six military establishments was as follows:

	Acres
Fort Belvoir:	
Dogue Creek	620
Gunston Cove (including Pohick Creek and Accotink Creek)	810
Potomac River (Maryland side)	54
Total	1,484
Fort Washington:	
Potomac River (Fort Washington-Mockley Point)	142
Piscataway Creek	590
Swan Creek and adjacent Potomac River	70
Total	802
Fort Hunt:	
Little Hunting Creek and adjacent Potomac River	240
Quantico Marine Barracks:	
Quantico Creek and adjacent Potomac River	515
Stump Neck—Naval Proving Grounds:	
Chicamuxen Creek	123
Indian Head—Naval Powder Factory:	
Mattawoman Creek and Potomac River	30

In addition to the above water-chestnut acreages, 570 acres of inland swamp were regularly dusted during the season.

The total area dusted varied from a maximum of 3,764 acres during the week of July 4 to a minimum of 1,140 acres during the week of September 19. The average application per acre for each treatment for the season was 5.40 pounds of insecticide mixture containing 1.24 pounds of paris green. At the beginning of the season (week of July 4) a minimum of 1.01 pounds of paris green per acre was applied, while a maximum of 1.52 pounds per acre was applied during the height of the breeding season (week of August 29). A total of 32,536 acres was dusted during the entire season, using 40,277 pounds of paris green and requiring 243 hours and 47 minutes of dusting time. Dusting was done at 7-day intervals over a period of 12 weeks, extending from the week of July 4 to the week of September 19.

Good dust coverage of the breeding acres was indicated by routine observations of operations and by the finding of low *Anopheles* larval densities within the control limits as compared to those beyond such limits. The entire project, including all expenditures for supervision, labor, and materials, was accomplished at an average cost of $1.20 per acre per application.

FIGURE 2.—Dusting operations on Potomac River with Stearman biplane.

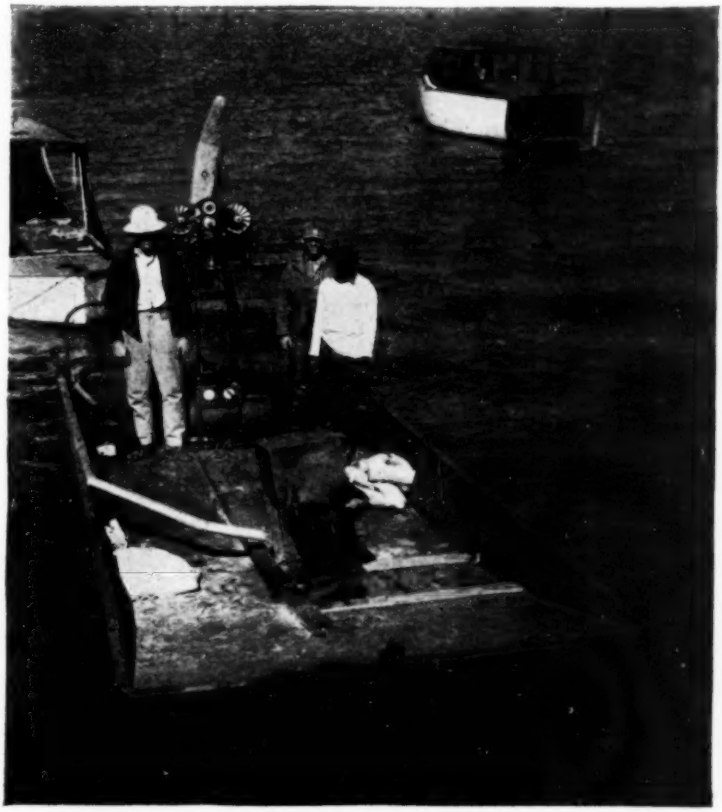

FIGURE 3.—Airplane-engine-propelled boat equipped with power duster.

FIGURE 4.—Upper—Powder box used as adult resting place. Lower—Target pit used as adult resting place.

A summary for the season's operations, showing the total acreage dusted, amounts of dust applied, dusting time, and rates of application is given in table 1.

TABLE 1.—*Summary of dusting operations of water-chestnut areas, Potomac River, 1943*

Areas	Acreage	Paris green (pounds)	Pounds paris green per acre	Diluent soapstone (pounds)	Dusting time	
					Hrs.	*Min.*
Fort Belvoir	13,429	17,858	1.34	59,949	114	02
Fort Hunt	940	1,468	1.56	4,913	11	22
Fort Washington	5,236	6,937	1.32	23,182	52	46
Indian Head	3,665	3,781	1.03	12,666	19	55
Stump Neck	1,086	1,580	1.46	5,304	7	26
Quantico	7,680	8,105	1.06	27,144	35	10
Areas outside control zone	500	548	1.09	1,837	3	06
	32,536	40,277	1.24	134,995	243	47

ENTOMOLOGICAL SERVICES

The entomological services on the program were under the direction of the junior author. These consisted primarily of coordinating the inspection work of the States concerned, by which effectiveness of the dusting was determined. Based upon the data obtained, recommendations were made to the operations officer, to guide him in regulating the frequency, rate, and extent of dust applications.

In order to determine the efficiency of the larvicide work and its effect in controlling *A. quadrimaculatus*, 55 larval and 53 adult index stations were established, at which inspections were made at least once each week. The majority of these stations were located within the dusted area (within "control limits"), which included the area within approximately 1 mile of each respective military establishment. Other adult and larval stations were established outside the dusted area (outside "control limits") to serve as a check on dusting effectiveness. Larval samplings, made with a pint dipper, totaled 110,000 for the season. *A. quadrimaculatus* made up 12 percent of the mosquito population. Of the remainder, *Uranotaenia sapphirina* (O. S.) made up 49 percent and *Culex* spp. 39 percent. The *Culex* species ranked as follows in order of abundance: *salinarius* Coq., *erraticus* D. & K., *restuans* Theob., *apicalis* Adams, and *pipiens* L. Airplane-engine-propelled boats (fig. 3) were used chiefly in making these larval inspections. Several types of natural resting places, as well as suitably placed powder boxes (fig. 4) measuring 12 by 16 by 29 inches were used as adult index stations.

Reduction of potential malaria hazard.—Although immediate needs for dust applications are determined by the number of small and large larvae and pupae found weekly in the water samplings, the effectiveness of a control program in reducing the potential malaria hazard is

best measured by the number of females present in the area, since the adult female alone transmits the disease. An index to the abundance of adult females is obtained by the numbers occurring in natural resting places. The highest female count during any one series of resting-place examinations inside the control limits as compared to those outside has been used to determine results (fig. 5). In the charts presented herein the curves representing collections outside control limits have been smoothed by application of the formula $\frac{a+2b+c}{4}$, when b is the count being smoothed and a and c the counts immediately preceding and succeeding, respectively.

Anopheles breeding conditions in controlled areas.—At Fort Belvoir, the first anopheline larvae were taken on July 13. Collections were very low or negative throughout the season but reached a small peak during early September, when small larvae appeared in relatively large numbers. During the season only three large larvae, and no pupae, were taken in more than 16,000 dips. Adult collections also remained low (fig. 5). The highest collection from any one resting place adjacent to the Fort was 1 male and 3 females, and the highest within the control limits was 12 males and 4 females. Both of these collections occurred on August 17. Further evidence of scarcity of *A. quadrimaculatus* in this control area is given by a comparison of 1942 and 1943 light-trap catches. During August of 1942 a maximum of 474 females was taken in one single collection, with a mean for the month of 69.4 per night per trap; the maximum for August 1943 was 3 females, with a mean of 0.31 per night per trap.

At Fort Hunt, cutting of the water chestnut by the United States Engineers early in the season greatly reduced the breeding possibilities. Collections in the river totaled only three larvae, and only six adults were taken from resting places during the season (fig. 5).

At Quantico, larval collections were consistently low, with the exception of one series of collections during the last half of August, when 42 small and 9 large larvae were found. Weekly dusting operations apparently were successful in preventing any considerable emergence in this instance, as only 3 adults were taken subsequent to this high larval collection. During the early season, adult station collections also remained low (fig. 5). The maximum adult density for the entire season was reached on August 18, when an average of 6.5 males and 5.7 females per resting place occurred. The highest individual resting-place count adjacent to the Quantico base also occurred on this date, when 7 males and 6 females were taken.

At Fort Washington, the only major problem was encountered, and this was limited to the early portion of the season. Breeding began on July 1, when 6 larvae were taken in 3,420 dips. This

was 13 days in advance of the finding of larvae in any other control area. Dusting operations began on July 8, and on July 10 no larvae or pupae could be found in inspections which involved the taking of 4,560 dips. Larval counts continued low until August 4, when 80 large larvae were found in 890 dips. On this occasion dusting planes were immediately dispatched to the breeding area for supplementary work. On the following day only 2 large and 2 small larvae

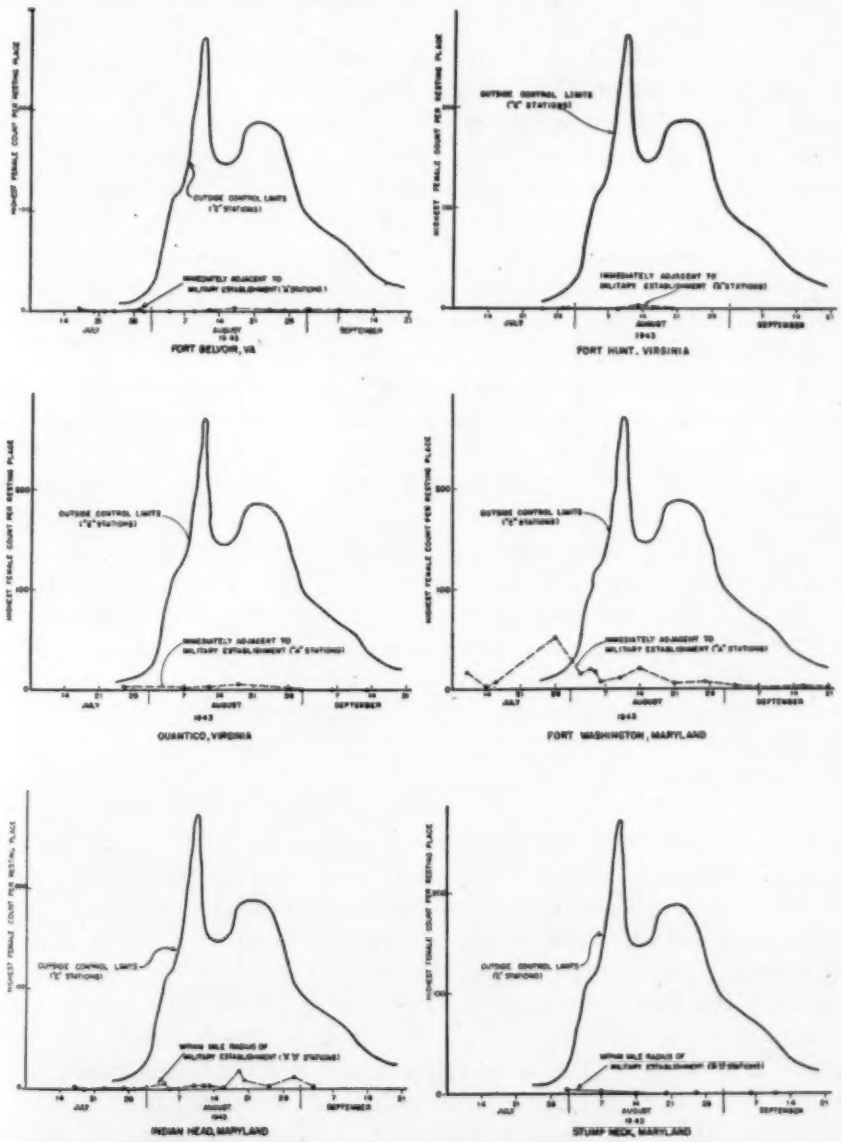

FIGURE 5.—Results of *Anopheles quadrimaculatus* control work on the Potomac River. (Outside adult densities compared with those inside.)

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could be found in 560 dips. The finding of adults and larvae in this control area 2 weeks in advance of the other water-chestnut areas gives a likely explanation for the fact that populations here exceeded those outside the control area from the beginning of the season (July 8) until the end of July (fig. 5). The highest resting-place count of the season adjacent to the fort was made on July 28, when 46 males and 54 females were taken in a target pit (fig. 4), a large ideal shelter. After the first week in August, mosquito counts adjacent to the fort remained relatively low.

Although breeding of *A. quadrimaculatus* during 1943 was greater at Fort Washington than at any other of the war areas along the river, it was considerably lower than during 1942. In August of that year, before plane dusting was initiated, individual counts of adults in shelters reached a maximum of 1,200 specimens, this collection being made in the above-mentioned target pit. The mean number of larvae taken per dip for that month was 0.33. Corresponding records for 1943 showed a maximum count of only 55 males and 15 females, which also occurred in the target pit, and only 0.0117 larvae per dip.

A plausible explanation for the early and intensive infestation at Fort Washington is that large numbers of *A. quadrimaculatus*, which were found overwintering in cement blockhouses on the reservation, dispersed early and oviposited in the water chestnut at first opportunity. It seems likely that the early season infestation of the water chestnut in this area might be materially reduced by killing the females in the cement houses before they emerge from hibernation in the spring. Although larval density was very low at the beginning of the season, it was scattered over a large breeding area of 590 acres. This early breeding resulted in the production of a considerable number of adults before dusting operations began, and high resting-station counts resulted from these adults concentrating in the few good natural resting places.

At Stump Neck, collections of both adults and larvae of *A. quadrimaculatus* were very low throughout the season (fig. 5). A total of only 16 small and 3 large larvae, and 3 male and 6 female adults, were found. No adults were taken immediately adjacent to the establishment, and the highest individual collection was 1 male and 3 females at a resting place nearly 1 mile away.

At Indian Head, the water chestnut was confined to a narrow strip along the river channel. In this strip only 5 large larvae were taken, and it is believed that some of these floated in from uncontrolled areas upstream. Resting-place counts were also very low throughout the season at all index stations, with one exception, a springhouse. In this station adults were constantly found, with numbers reaching a peak of 19 males and 19 females on August 19 (fig. 5). Numerous

potential upland breeding places occur in this vicinity, and it appeared that these places were the principal breeding areas, since adults continued to be present in numbers several weeks after the disappearance of the water chestnut in the river.

Anopheles breeding conditions in uncontrolled areas.—In the water-chestnut areas outside control limits, *quadrimaculatus* breeding began about July 13, but high populations were not encountered until the first week in August. Thereafter the larval densities in these areas greatly exceeded those within the control limits. Maximum densities were reached on September 1, when 650 larvae were taken in 70 dips; following this a rapid decrease in numbers occurred. By mid-September only small patches of the water chestnut remained, but in these there was heavy breeding. Because of this condition, and in an effort to decrease the numbers of adults entering hibernation, all remaining water-chestnut areas were dusted on September 15 and 23. The occurrence of adults in resting places in these uncontrolled areas (fig. 5) likewise greatly exceeded those within the control limits. Adult densities began to rise abruptly in early August, peaks being reached on the 11th and 25th. On the former date a total of 900 males and 800 females were taken in two powder boxes, and on the latter date 524 males and 566 females were taken from these same places. Thereafter the numbers gradually decreased, and none was found in late September.

Reduction of general anopheline populations.—As has been stated, the size of the adult female *quadrimaculatus* population in an area determines the potential malaria hazard as far as the vector is concerned. The general effect of control measures in reducing anopheline populations, in this case the application of paris green as a larvicide, can only be measured by considering the ratio of collections of larvae and of adults inside with those in similar areas outside the control limits. This comparison is given in figure 6 and table 2.

TABLE 2.—*Control of* A. quadrimaculatus *at six military establishments on the Potomac River*

[Densities of larvae and adults outside control areas compared to those inside]

Location	Number of larvae per 100 dips for season		Indicated control based on large larvae [1] (percent)	Number of adults per resting place for season		Indicated control based on adult females (percent)
	Small	Large [1]		Males	Females	
Uncontrolled areas	44.60	40.53		73.1	63.9	
Controlled areas:						
Fort Washington	.47	.54	98.67	14.0	6.5	89.83
Indian Head	.14	.01	99.98	1.6	2.2	96.58
Quantico	.50	.16	99.61	1.6	1.6	97.50
Fort Belvoir	.60	.02	99.96	.7	.9	98.59
Fort Hunt	.08	.04	99.91	.4	.4	99.38
Stump Neck	.44	.09	99.78	.1	.2	99.69
Mean (controlled areas)	.37	.14	99.65	3.0	2.0	96.93

[1] Includes pupae.

The table shows the densities of larvae and adults inside and outside control areas, as indicated by index-station collections, and the approximate percentage of general control based on comparable adult female collections. It is believed that the inside and outside indexes are quite comparable because of the uniform breeding habitat furnished by the water chestnut. As shown by the figures presented, the control varied from a minimum of 89.83 percent at Fort Washington to a maximum of 99.69 percent at Stump Neck, with a mean of 96.93 percent control for all six military establishments.

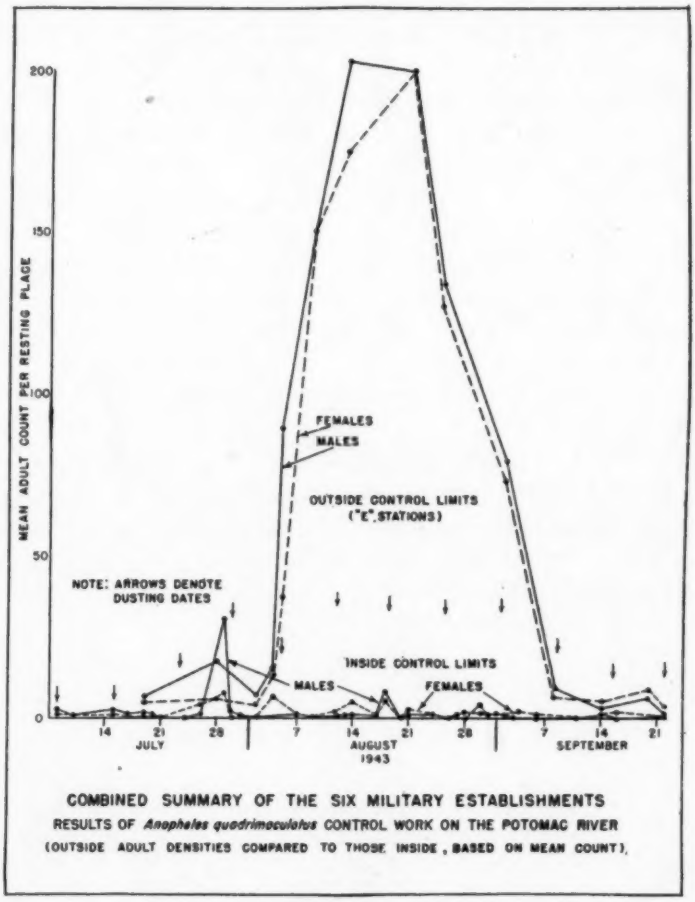

FIGURE 6.

SUMMARY AND CONCLUSIONS

Water-chestnut-covered areas in the Potomac River afford prolific breeding grounds for *A. quadrimaculatus*, the principal malaria vector in eastern United States. Because of the close proximity of six military establishments to these areas, control measures against this mosquito were carried on in 1942 and 1943 by the Office of Malaria

Control in War Areas of the United States Public Health Service. This paper deals with the more comprehensive control program of the latter year.

Weekly dustings with paris green applied by airplane were made throughout the *quadrimaculatus* breeding season. A total of 32,536 acres was dusted, and 40,277 pounds of paris green were applied.

The average cost of the work was $1.20 per acre per application. This includes all expenditures for supervision, labor, and materials.

An indicated over-all control of 96.93 percent of *A. quadrimaculatus* mosquitoes in the protected areas was shown by weekly inspections carried out at more than 100 larval and adult index stations. These stations were located both inside and outside of the control zones, and the degree of control was determined by comparing the numbers of mosquitoes inside to those outside.

The most important factors in the successful prosecution of this work were:

(1) Complete organization in advance of inauguration of control operations.
(2) Coordination between, and full utilization of, engineering and entomological services.
(3) Regulation of frequency, rate, and extent of dust application through careful consideration of entomological findings.
(4) Skillful work of the airplane pilots in applying the larvicide.
(5) Detailed and close supervision of operations and inspections.

THE THERAPEUTIC EFFICACY OF PENICILLIN IN RELAPSING FEVER INFECTIONS IN MICE AND RATS [1]

By HARRY EAGLE, *Surgeon*, and HAROLD J. MAGNUSON, *Assistant Surgeon United States Public Health Service*, with the technical assistance of ARLYNE D. MUSSELMAN

The demonstrated effectiveness of penicillin in the treatment of, many bacterial diseases has prompted search for other infections in which this antibiotic might prove useful. The recent finding by Mahoney, Arnold, and Harris (*1*) that penicillin was of value in the treatment of syphilis suggested that penicillin might also be effective against the spirochetes of relapsing fever, this despite fundamental differences in the metabolism of the two organisms. The present report deals with the efficacy of penicillin in the treatment of white rats and mice experimentally infected with *Borrelia novyi*.

METHODS AND MATERIALS

Throughout the course of the experiment, the strain of *B. novyi* [2] was maintained by passage in rats at 3-day intervals, 0.1 cc. of infected

[1] From the Venereal Disease Research and Postgraduate Training Center, U. S. Public Health Service, Johns Hopkins Hospital, Baltimore, Md.

[2] Kindly supplied by Dr. Martin Frobisher and Dr. Ts'un T'ung of the Johns Hopkins School of Hygiene.

blood injected intraperitoneally regularly producing a massive blood infection within 24 to 48 hours.

Preliminary experiments soon indicated that while penicillin was effective against *B. novyi* infections in both rats and mice, in determining the minimum curative dose rigorous controls would have to be maintained because of the irregular and relapsing course of the disease in these animals. With a small inoculum (10^5 organisms into a white mouse), organisms disappeared from the blood within 72 to 96 hours and could thereafter be demonstrated in only a small proportion of the animals. Even the inoculation of 10^7 and 5×10^7 organisms into rats and mice, respectively, failed to produce a uniformly fatal infection. Here also the well-known tendency of the organisms to disappear spontaneously from the blood stream made the direct examination of the blood an inadequate criterion of cure. Accordingly, rats and mice which had been apparently "cured" by penicillin, in that the blood was persistently dark-field negative, were further tested 5 to 15 days after the completion of treatment by injecting their citrated blood, obtained by cardiac puncture, into a normal animal (0.4 to 0.5 cc. for rats and 0.1 to 0.2 cc. for mice). The blood of the transfer animal was examined at intervals over the following 2 weeks. Even this was not a rigid criterion of cure, since only 6 of 10 untreated rats proved infectious when their blood was transferred during a dark-field negative phase. It is therefore probable that some animals adjudged "cured" may nevertheless have harbored residual organisms. This would be particularly true at dosages which "cured" only a portion of the animals.

RESULTS IN WHITE RATS

Young white rats weighing between 45 and 80 gm.[3] were inoculated intraperitoneally with 0.5 cc. of infected blood diluted with normal rat serum or plasma so as to contain 2×10^7 organisms per cubic centimeter. The inoculum thus consisted of 1×10^7 organisms. Treatment was begun 24 hours later, when large numbers of spirochetes could always be found by dark-field examination of the peripheral blood. The calculated dose of the sodium salt of penicillin in 0.1 to 1.0 cc. of 0.85 percent NaCl was given intraperitoneally five times daily at 4-hour intervals (8 a. m., 12 n., 4 p. m., 8 p. m., and 12 m.) for each of 2 successive days. In four separate experiments a total of 71 rats was treated at various dosage levels and 20 rats were used as untreated controls (table 1).

Twelve hours after the completion of treatment, blood from the control animals contained enormous numbers of spirochetes. Most rats which had received a total of only 5,000 or 10,000 units of peni-

[3] Within an individual experiment, weights differed by a maximum of 20 gm. Each rat was treated on a per kilogram basis.

cillin were also dark-field positive, but with relatively few organisms; animals treated with larger doses were regularly dark-field negative. However, beginning 36 hours after the completion of treatment, a considerable number of the treated and apparently "cured" animals began to relapse. These were considered treatment failures. Additional failures were found by injecting the blood of rats which failed to relapse into normal rats as described above.

Table 1 is a summary of four individual experiments, each with a different commercial brand of penicillin, and all with quantitatively similar results. As is there shown, the dose which cured 50 percent of the animals was approximately 130,000 units per kilogram of body weight, and the dose necessary to cure 95 percent of the animals was approximately 400,000 units per kilogram. The latter curative dose approached the toxic level of the particular lot of commercial penicillin used in that experiment.[4]

TABLE 1.—*The efficacy of penicillin in the treatment of relapsing fever* (Borrelia novyi) *in white rats*

[Animals were inoculated intraperitoneally with 10^7 organisms. Treatment with penicillin (intraperitoneal) was begun 24 hours later, repeated five times daily at 4-hour intervals for 2 days. Dosages are expressed in Oxford units]

Penicillin dosage		Number of rats treated [1]	Treatment failures			Total failures	"Cures"	Results recalculated by method of Reed and Muench (6)			Curative dose	
Units/kg. per injection	Units/kg. total		Deaths [2]	Spirochetes reappearing in blood more than 36 hours after completion of treatment	Blood infectious despite persistent absence of visible spirochetes			Failures	"Cures"	Percent "cured"	CD_{95} [3]	MCD [3]
1,000	10,000	4	----	4	0	4	0	28	0	0	130,000 units per kg.	400,000 units per kg.
2,000	20,000	6	----	3	2	5	1	24	1	4		
4,000	40,000	10	1	4	3	7	2	19	3	14		
8,000	80,000	10	1	1	3	4	4	12	7	34		
16,000	160,000	11	1	5	1	6	4	8	11	58		
32,000	320,000	11	----	1	1	2	8	2	19	90		
64,000	640,000	[4] 14	[4] 2	0	0	0	12	0	31	100		
Controls	0	20	9	11	Of 10 rats tested during dark-field-negative phase, the blood of 6 proved infectious for normal rats.	----	----	----	----	----		

[1] Five deaths occurring before completion of treatment not included in following columns.
[2] Because of possibility that these may have been adventitious deaths, they are not included in the column "total failures."
[3] CD_{95}=dose which cured 50 percent of animals. MCD=minimal curative dose (>95 percent cured).
[4] Three rats died within 12 hours after completion of treatment, and two additional animals died in the following 4 days, perhaps due to the toxicity of the drug.

[4] Five of 14 rats receiving total dosages of 640,000 units penicillin per kilogram (individual injections of 64,000 units per kilogram) died during treatment, or soon after, apparently because of the primary toxicity of the particular preparation used. This is to be compared with the results reported by Hamre, Rake, McKee, and MacPhillamey (5) who found that a single injection of 100,000 units penicillin (1 gm. of the crude preparation) per kilogram produced severe reactions or death in mice, guinea pigs, and rabbits. Whether these deaths observed in rats were due to penicillin itself, or to associated impurities, will be resolved as purer preparations become available.

RESULTS IN MICE

A single experiment was carried out with male white mice weighing 16 to 20 gm. This was similar to the rat experiment, save that the mice were inoculated with five times as many organisms (5×10^7), and the volume of each treatment varied between 0.14 and 0.57 cc. It is of interest to note that the occasional toxic deaths observed in rats at the highest dosage of penicillin (64,000 units per kilogram, repeated every 4 hours) were not observed in mice simultaneously treated at the same dosage with the same lot of penicillin.

TABLE 2. — *The efficacy of penicillin in the treatment of relapsing fever* (Borrelia novyi) *in white mice*

[Animals were inoculated intraperitoneally with 5 x 10^7 organisms. Treatment with penicillin (intraperitoneal) was begun 24 hours later, repeated five times daily at 4-hour intervals for 2 days. Dosages are expressed in Oxford units]

Penicillin dosage		Number of mice treated [1]	Treatment failures			Total failures	"Cures"	Results recalculated by method of Reed and Muench (6)			Curative dose	
Units/kg. per injection	Units/kg. total		Deaths	Spirochetes reappearing in blood more than 30 hours after completion of treatment	Blood infectious for normal mice 10 days after treatment, despite persistent absence of visible spirochetes			Failures	"Cures"	Percent "cured"	CD_{50} [2]	MCD [2]
2,000	20,000	5	2	1	1	4	1	15	1	6	100,000 units per kg.	400,000 units per kg.
4,000	40,000	6	4	1	0	5	1	11	2	15		
8,000	80,000	5	3	0	0	3	2	6	4	40		
16,000	160,000	5	1	0	0	1	4	3	8	73		
32,000	320,000	6	1	1	0	2	4	2	12	86		
64,000	640,000	5	0	0	0	0	5	0	17	100		
Controls	0	8	4	3	0	7	1 transfer also negative	----	----	----		

[1] Five mice which died before treatment was completed are not included in the following columns.
[2] CD_{50}=dose which cured 50 percent of animals. MCD=minimal curative dose (> 95 percent cured).

Because of the larger inoculum, a considerable proportion of the control untreated mice, and of those receiving relatively small doses of penicillin, died within a few days after inoculation. As with the rats, some of the mice relapsed. The dose which cured 50 percent of the mice was approximately 100,000 units per kilogram, and the dose which cured 95 percent was approximately 400,000 units per kilogram. Both values are reasonably close to the corresponding values in white rats.

DISCUSSION

As this work was being completed,[5] reports appeared from twe different laboratories indicating penicillin to be effective in tho

[5] A preliminary report on the efficacy of penicillin in the treatment of experimental relapsing fever was submitted to the Committee on Medical Research on November 1, 1943.

treatment of *B. novyi* infections in mice. Large doses were used in both instances, and no attempt was made to determine the minimum curative dose. In the experiments reported by Heilman and Herrell (*2*), 26 mice were treated with a total of 4,000 units of penicillin, or approximately 200,000 units per kilogram, distributed in five injections daily over a 4-day period. Only 1 of the treated mice died, while 21 of 28 untreated control mice died. No transfers were made to normal mice as a criterion of actual cure.

In the experiments reported by Augustine, Weinman, and McAllister (*3*), 6 mice were treated with a total of 9,000 units, or approximately 450,000 units per kilogram, administered in divided doses every 3 hours over a 48-hour period, with 5 mice as untreated controls. No spirochetes were seen in the blood of treated mice 27 hours after treatment, and the blood of two mice failed to infect normal mice 60 hours after treatment. The blood of a single mouse which had received a total of 4,000 units in 19 hours, or approximately 200,000 units per kilogram, was found to be infectious for a normal mouse, although no spirochetes could be seen in the original blood specimen.

In our own experiments, the CD_{50} in both rats and mice has been found to be on the order of 100,000 to 130,000 units per kilogram, and the regularly curative dose on the order of 400,000 units per kilogram. If those results are applicable to man, the curative dose in a man weighing 60 kg. would be approximately 25,000,000 units. At least until penicillin is available in larger amounts, its routine use in such large doses would not appear warranted for an infection which usually responds promptly to arsenical therapy, and particularly in view of the possible toxicity at those high dosages of the relatively crude penicillin preparations presently available.

It is possible, if unlikely, that other strains of this organism may be considerably more susceptible to penicillin than the novyi strain hitherto used. It is further possible that the disease is more amenable to treatment in man than it is in rats or mice. For the present, however, or until these possibilities have been explored, the only practical application of penicillin in the treatment of relapsing fever would appear to be those cases which, like the three reported by Francis (*4*), fail to respond to arsenical therapy.

SUMMARY

The total dosages of penicillin which "cured" 50 percent of white rats and mice infected with *Borrelia novyi* were 130,000 units and 100,000 units per kilogram, respectively. Approximately 400,000 units per kilogram were necessary to cure more than 95 percent of the

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animals. This was half the dose which killed a significant proportion of the rats.

If these results can be translated to man, they imply that the curative dose of penicillin in man would be on the order of 25,000,000 units. Unless relapsing fever is more amenable to treatment in man than it is in these experimental animals, or unless other strains of the organism prove more susceptible to penicillin, the therapeutic use of the drug would not appear warranted except in arsenic-resistant cases, at least until such time as it is available in larger quantities.

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DEATHS DURING WEEK ENDED APRIL 22, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Apr. 22, 1944	Corresponding week, 1943
Data for 93 large cities of the United States:		
Total deaths	9,288	9,417
Average for 3 prior years	8,755	
Total deaths, first 16 weeks of year	160,440	161,465
Deaths under 1 year of age	608	640
Average for 3 prior years	590	
Deaths under 1 year of age, first 16 weeks of year	10,130	11,271
Data from industrial insurance companies:		
Policies in force	66,380,649	65,493,588
Number of death claims	13,160	12,121
Death claims per 1,000 policies in force, annual rate	10.4	9.7
Death claims per 1,000 policies, first 16 weeks of year, annual rate	11.2	10.6

PROVISIONAL MORTALITY FOR THE FIRST 9 MONTHS OF 1943

The mortality rates in this report are based upon preliminary data from 39 States, the District of Columbia, Alaska, Hawaii, and the Canal Zone. Comparative data for the first 9 months of 1942 and 1941 are presented also for 37 States and the District of Columbia.

This report is made possible through a cooperative arrangement with the respective States, which furnish provisional quarterly tabulations of current births and deaths to the United States Public Health Service. Because of some lack of uniformity in the method of classifying deaths according to cause, as well as some delay in filing certificates, these data are preliminary and some deviation from the final figures may be expected, especially for specific causes of death for individual States. However, in the past these preliminary reports have reflected with considerable accuracy the trend in mortality for the country as a whole, and it is believed that the trend in each State is reasonably accurate even though the comparison of the causes of death for different States is subject to the errors mentioned above.

Population estimates for the different States used in computing rates were as follows: 1943—official United States Census Bureau estimates of the total population in each State as of March 1, 1943, based on registration for War Ration Book Two and corrected for soldiers and sailors stationed within the States; 1942—United States Census Bureau estimates of the total population as of July 1, 1942, based on registration for War Ration Book One with the same corrections noted above; 1941—average of the total enumerated population according to the Federal census of April 1, 1940, and the estimated total population as of July 1, 1942.

The mortality rate from all causes for the first 9 months of 1943 was about 4 percent higher than that for the first 9 months of 1942, but it was the same as the rate for the corresponding period in 1941. The increase in the death rate from all causes has been widespread; 27 of the 38 States for which data are available reported a higher rate in 1943 than in 1942, 10 reported a decrease in the rate, and in 1 State the rate was the same. During each of the 3 quarters of the year the rate exceeded that for the corresponding quarter in 1942. The death rate from all causes among persons insured in the industrial department of the Metropolitan Life Insurance Co. for the first 9 months of the year was almost 8 percent above the rate for the first 9 months of 1942, and about 4 percent above the rate for the same period in 1941. Preliminary figures for 42 States and the District of Columbia, based on data received from the Bureau of the Census, show a death rate from all causes of 10.9 for the first 9 months in 1943, as compared with 10.2 for the first 9 months in 1942.

The birth rate for the first 9 months of 1943 was 21.2 per 1,000 population, an increase of almost 8 percent over the corresponding period in 1942, and more than 15 percent over 1941. Thirty-five of the 36 States for which information is available reported an increase in the birth rate over the first 9 months in 1942, and in 1 state the rate was the same. The rate increased in each of the 3 quarters of 1943 over the corresponding quarter in each of the 2 preceding years.

Infant and maternal mortality continued to decrease. Infant mortality in the first 9 months of 1943 was 40 per 1,000 live births, as compared with 41 and 46 for the corresponding period in 1942 and 1941, respectively. During the first and second quarters of 1943 the rate was lower than in the corresponding quarters of each of the 2 preceding years, but during the third quarter the rate was the same as in 1942 but lower than in 1941. In 22 of the 38 States with available data the infant mortality rate was lower than in 1942, in 11 States it was higher, and in 3 States the rate for the 2 years was the same. The maternal mortality rate dropped from 3.2 for the first 9 months of 1941 to 2.6 in the corresponding period in 1942, and to 2.4 for the first 9 months of 1943. The rate was lower for each of the 3 quarters of the year 1943 than in the corresponding period in each of the 2 preceding years. Twenty-three of the 35 States with available data reported a decline from the 1942 rate, 9 showed an increase, and in 3 States the rate was the same as in 1942.

The influenza and pneumonia rates were both higher during the first 9 months of 1943 than in the same period in 1942. The influenza rate, however, was considerably below the rate for the first 9 months of 1941 and the pneumonia rate was about 5 percent below the 1941 rate. Of the 38 States with available data, 23 had higher influenza rates in 1943 than in 1942, and 24 States had higher pneumonia rates; 14 States had lower influenza rates in 1943 than in 1942 and 13 had lower pneumonia rates; in 1 State the rate for each disease was the same in 1943 and 1942. The incidence of influenza was somewhat above the normal level throughout the first 9 months of the year, but up to the end of that period there had been no indication of the outbreak that occurred later in the year. While the cases were of a mild type, the epidemic will no doubt be reflected in the death rates from influenza and pneumonia in the fourth quarter of the year.

The tuberculosis death rate was lower in the first 9 months of 1943 than in the same period of each of the 2 preceding years. A comparison by quarters, however, shows that the rate was relatively low during the first quarter of 1943 but was higher than in 1942 in both the second and third quarters. Twenty-one of the 38 States reporting had a higher tuberculosis rate during the first 9 months of 1943 than during the same period in 1942; in 16 States the rate was lower

in 1943 and in 1 State the rate was the same as in 1942. More than one-half of the States reporting higher rates in 1943 were located in the North Atlantic and North Central regions; no increases were reported from any State in the South Atlantic, East South Central, or Pacific regions.

There was an increase in each of the degenerative diseases during the first 9 months of 1943 over the first 9 months of 1942. The cancer and nephritis rates were about 1 percent higher than the corresponding rates for 1942, and the rates for diabetes and intracranial lesions of vascular origin were approximately 6 percent above the 1942 rates. For diseases of the heart the death rate increased from 290 per 100,000 for the first 9 months of 1942 to 311 for the same period in 1943.

Among the communicable diseases, whooping cough, cerebrospinal meningitis, and poliomyelitis had unusually high death rates during the first 9 months of 1943. Cerebrospinal meningitis maintained a relatively high level throughout the first 9 months of the year, with 33 States reporting higher death rates than in the same period of 1942. Poliomyelitis remained about normal during the first and second quarters of the year, but a serious outbreak started during the third quarter and continued to the end of the year. Twenty States reported a higher poliomyelitis death rate than in 1942; in 8 States the rate was lower and in the other 10 States the rate was the same as in 1942.

The death rate from all accidents for the first 9 months of 1943 was 67 per 100,000 population, as compared with 66 and 72 for the same months in 1942 and 1941, respectively. The automobile accident death rate was 14.1, as compared with 19.7 in 1942 and 26.0 in 1941. Twenty-one of the States reported a decline from 1942 in the death rate from all accidents and all of the 38 States reported a lower rate in 1943 from automobile accidents. The death rate from accidents other than automobile increased from 46 in the first 9 months of 1941 to 53 for the same period in 1943.

Provisional mortality from certain causes in the first 9 months of 1943, with comparative provisional data for the corresponding period in preceding years

State and period	All causes, rate per 1,000 population (annual basis)	Births (exclusive of stillbirths) per 1,000 population (annual basis)	Rate per 1,000 live births		Death rate per 100,000 population (annual basis)																					
			Total infant mortality	Maternal mortality	Typhoid and paratyphoid fever (1–2)	Dysentery (27)	Diarrhea and enteritis under 2 years (119)	Scarlet fever (8)	Diphtheria (10)	Whooping cough (9)	Measles (35)	Cerebrospinal (meningococcus) meningitis (6)	Acute poliomyelitis and poliencephalitis (36)	Acute infectious encephalitis (lethargic) (37)	Tuberculosis, all forms (13–22)	Syphilis (30)	Influenza (grippe) (33)	Pneumonia, all forms (107–109)	Cancer, all forms (45–55)	Diabetes mellitus (61)	Intracranial lesions of vascular origin (83)	Diseases of the heart (90–95)	Nephritis, all forms (130–132)	All accidents, including automobile accidents (169–195)	Automobile accidents (170 a,b, c)
38 States [1]																										
January–September:																										
1943	10.5	21.2	40	2.4	0.5	1.3	7.0	0.3	0.6	2.5	1.1	2.0	0.8	0.5	41.5	10.7	8.7	47	123	26.9	93	311	71	67	14.1
1942	10.1	19.7	41	2.6	.5	1.3	6.3	.3	.6	1.8	1.0	.6	.4	.4	42.0	11.0	7.9	44	122	25.5	88	290	70	66	19.7
1941	10.5	18.3	46	3.2	.8	(2)	7.3	.3	.6	2.8	1.9	.5	.5	.8	44.3	(3)	18.2	49	121	26.3	87	294	73	72	26.0
January–March:																										
1943	11.4	20.9	44	2.3	.3	.5	4.2	.5	.9	2.4	1.1	2.4	.2	.5	41.2	11.7	15.2	70	123	29.7	102	350	77	65	13.6
1942	11.1	18.8	46	2.7	.3	.8	3.4	.5	.9	1.9	1.5	.6	.2	.4	43.3	11.7	15.1	67	123	28.9	98	327	78	67	22.5
1941	11.8	17.2	53	3.2	.5	(2)	3.4	.5	.8	2.8	1.5	.6	.3	.5	46.7	(3)	44.0	80	121	30.9	97	342	83	67	23.2
April–June:																										
1943	10.7	20.5	40	2.4	.4	1.1	6.2	.3	.5	2.7	1.7	2.5	.3	.5	44.5	10.8	8.2	47	124	27.8	95	318	75	67	13.0
1942	9.9	18.7	41	2.5	.5	1.1	5.5	.3	.3	1.8	1.3	.7	.2	.4	44.3	11.1	6.3	40	121	25.3	87	287	69	65	18.1
1941	10.2	17.6	45	3.3	.6	(2)	5.6	.4	.4	3.0	3.5	.5	.3	.5	46.4	(3)	8.4	40	121	25.8	87	289	73	69	24.3
July–September:																										
1943	9.5	22.1	37	2.4	.8	2.2	10.6	.2	.5	2.5	.4	1.2	1.8	.5	38.8	9.6	2.8	25	124	23.4	83	265	62	68	15.6
1942	9.4	21.4	37	2.6	.7	2.0	10.0	.2	.5	1.7	.2	.5	.7	.4	38.6	10.1	2.6	26	122	22.4	80	258	62	68	18.7
1941	9.5	20.0	40	3.0	1.2	(2)	12.7	.2	.7	2.6	.7	.4	1.0	1.4	39.9	(3)	2.6	26	120	27.2	78	252	63	79	30.4
Industrial policyholders: [3]																										
1943	7.9	----	----	----	.3	----	[4] 4.5	.4	.7	1.3	.7	----	----	----	40.9	9.9	5.6	36	106	28.5	66	[5] 231	[6] 51	52	12.2
1942	7.3	----	----	----	.3	----	[4] 4.2	.4	.5	1.0	.6	----	----	----	42.4	10.9	4.3	29	105	28.1	60	[5] 213	[6] 50	51	17.3
1941	7.6	----	----	----	.4	----	[4] 4.4	.5	.6	1.3	1.0	----	----	----	43.8	11.4	9.1	33	104	27.8	61	[5] 211	[6] 52	51	20.2
Alaska:																										
1943	19.5	20.8	136	2.5	(7)	(7)	1.7	1.7	3.5	63.9	15.5	1.7	(7)	(7)	357.6	(7)	44.9	161	81	1.7	82	181	25	314	8.6
1942	18.3	25.4	111	2.8	(7)	(7)	8.8	(7)	1.8	15.8	52.7	3.5	(7)	(7)	356.6	(7)	22.8	112	81	7.0	63	190	30	297	15.8
1941	19.3	27.7	100	5.2	3.6	(2)	5.4	(7)	(7)	7.1	59.0	1.8	3.6	(7)	443.3	(3)	80.4	127	95	5.4	82	202	36	189	(7)
Canal Zone:																										
1943	11.3	20.8	46	5.0	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	51.6	23.2	(7)	18	57	20.6	36	119	41	441	51.6

Colorado:																									
1943	10.9	21.3	48	2.2	.2	1.1	11.4	.7	1.5	1.5	3.8	3.1	2.5	.3	52.6	9.8	11.6	71	121	16.7	86	268	72	93	14.5
1942	11.1	19.9	52	2.0	.5	1.0	10.6	1.1	1.2	2.9	1.8	.7	.5	.6	51.7	10.1	8.5	76	120	17.7	96	266	76	92	26.5
1941	10.8	19.1	51	3.0	.8	(2)	10.9	.8	1.9	6.0	1.7	.6	.7	2.3	51.6	(2)	21.8	64	110	16.5	84	275	79	70	22.7
Connecticut:																									
1943	9.7	19.0	28	1.5	(2)	.2	3.5	.1	(2)	.4	.4	1.4	1.1	.6	31.6	6.7	2.9	32	138	28.9	85	330	52	54	10.9
1942	8.9	16.8	30	2.2	.1	(2)	2.5	(2)	(2)	.4	.3	.4	(2)	.1	33.0	6.4	1.7	24	130	27.4	79	291	58	54	13.6
1941	9.0	13.1	32	2.7	.2	(2)	1.8	.2	(2)	.5	.1	.2	.2	(2)	32.0	(2)	5.4	29	129	31.2	77	307	62	58	19.1
Delaware:																									
1943	11.3	20.6	39	2.3	.5	(2)	7.2	(2)	(2)	5.8	.5	8.6	(2)	1.0	34.1	14.4	8.6	65	110	35.5	110	354	132	62	17.3
1942	11.6	19.1	38	1.5	(2)	(2)	9.6	1.9	(2)	.5	(2)	(2)	(2)	1.0	51.8	12.5	5.8	50	125	30.7	104	370	128	74	24.0
1941	11.8	18.2	44	1.9	(2)	(2)	8.8	1.0	(2)	2.5	2.0	(2)	1.0	(2)	54.4	(2)	13.7	53	120	27.9	94	352	131	81	23.8
District of Columbia:																									
1943	10.6	26.2	41	1.8	.3	.6	13.0	1.1	(2)	5.3	.5	3.6	.3	(2)	57.0	14.9	3.9	56	135	28.2	58	282	91	52	8.7
1942	10.2	23.2	45	2.5	.3	.2	16.5	.2	.3	2.6	(2)	1.9	.2	(2)	57.9	19.5	2.3	57	126	25.8	67	262	86	63	14.5
1941	11.4	23.5	51	2.7	.7	(2)	17.5	(2)	.3	1.8	.7	.7	1.2	.2	57.9	(2)	4.7	68	141	24.3	80	284	98	69	20.6
Florida:																									
1943	9.5	17.5	48	4.8	.9	1.5	7.7	.2	1.0	2.6	.4	1.8	.3	.4	33.6	13.5	17.9	42	80	17.3	89	206	68	111	18.3
1942	10.5	17.3	52	4.8	1.4	1.8	7.8	.1	1.1	2.3	3.1	.7	.2	.1	40.5	18.0	13.5	47	90	18.0	102	244	72	93	25.4
1941	11.7	17.7	54	6.7	1.5	(2)	8.8	.1	.9	1.9	1.1	.7	1.9	.4	45.8	(2)	31.5	49	100	20.8	110	274	86	110	38.7
Georgia:																									
1943	8.3	22.3	49	3.8	.7	2.5	9.6	.2	1.0	6.0	.8	1.2	.0	.2	37.0	12.3	14.3	47	60	12.3	86	160	89	57	15.1
1942	8.5	20.7	52	4.0	.7	2.7	8.6	.1	1.0	3.2	2.3	.5	.4	.1	37.8	13.5	14.8	49	62	10.8	84	155	94	59	19.3
1941	9.7	20.6	60	4.5	1.7	(2)	15.3	.3	1.1	4.7	6.0	.5	1.1	.1	42.1	(2)	37.9	53	63	11.7	93	179	102	64	26.1
Hawaii:																									
1943	7.6	26.3	41	1.5	.3	.3	7.0	(2)	.3	4.2	(2)	.6	(2)	.3	57.1	13.9	5.4	39	77	18.1	47	131	52	119	20.9
1942	7.5	23.5	40	2.7	1.8	(2)	6.1	.3	.3	4.0	.3	.6	(2)	(2)	58.8	13.2	3.1	47	66	16.8	47	131	60	94	19.0
1941	7.0	22.7	42	2.5	1.6	(2)	9.9	(2)	.6	2.2	1.6	(2)	.6	.3	57.5	(2)	3.1	39	76	19.3	52	127	51	69	20.2
Illinois:																									
1943	11.5	19.6	34	2.0	.2	.4	3.8	.3	1.1	1.5	.9	1.7	2.2	.5	43.3	10.8	4.9	38	157	32.2	92	394	87	62	14.6
1942	10.9	17.7	35	2.0	.3	.7	2.8	.3	.7	1.3	.6	.2	.3	.3	40.8	10.5	4.4	39	147	30.4	83	350	81	65	21.2
1941	10.7	16.3	35	2.6	.4	(2)	3.2	.5	.6	1.1	1.4	.2	.3	.4	45.1	(2)	7.2	41	144	29.0	79	340	87	74	29.5
Indiana:																									
1943	11.2	20.7	40	2.3	.3	.4	8.8	.5	.5	3.8	2.6	1.4	.5	.5	33.6	8.8	17.9	55	122	15.2	142	260	86	71	17.3
1942	10.5	18.8	38	2.8	.2	.4	6.4	.5	.3	2.0	.4	.1	.6	.3	35.4	9.7	15.6	47	119	12.8	131	243	76	76	27.6
1941	11.1	17.4	38	3.0	.6	(2)	5.8	.7	.7	1.6	2.0	.5	.3	.2	37.4	(2)	23.0	49	121	15.1	138	272	66	91	39.7
Iowa:																									
1943	10.8	20.4	34	1.7	.1	.2	2.4	.9	.5	1.8	1.0	1.0	.7	.3	16.1	7.0	8.1	39	149	28.7	120	336	64	71	11.5
1942	10.1	19.2	34	2.2	(2)	.2	2.4	.3	.3	1.2	.8	.1	.1	.3	16.1	6.3	8.6	38	148	25.6	113	293	62	68	17.0
1941	9.8	17.0	38	2.8	.2	(2)	1.6	.4	.3	1.7	.6	.4	.2	.8	14.0	(2)	15.4	43	133	25.6	102	285	61	67	22.8
Kansas:																									
1943	10.7	19.8	34	2.2	.2	.4	2.7	1.0	.7	2.0	.5	1.6	4.1	1.3	20.9	9.9	12.4	35	130	28.1	116	299	86	89	16.2
1942	10.4	17.9	37	2.6	.2	.5	4.1	.4	.1	1.1	1.6	.3	.8	1.0	25.8	11.1	15.1	32	128	27.2	114	292	87	78	21.3
1941	10.7	17.2	39	2.2	.3	(2)	2.5	.3	.4	4.1	2.4	.6	.3	1.6	24.8	(2)	26.3	38	125	24.9	108	285	98	81	30.1
Kentucky:																									
1943	9.8	22.7	51	2.2	1.4	5.6	15.2	.4	.8	4.4	4.6	2.7	.4	.5	61.7	5.6	17.3	60	83	14.2	95	241	73	56	11.3
1942	9.7	21.3	53	3.1	1.5	5.5	13.9	.9	1.4	4.0	1.1	1.0	.9	.2	65.0	9.4	16.3	58	85	14.9	90	226	80	70	18.3
1941	10.7	21.3	60	4.6	2.5	(2)	20.9	1.1	.9	8.5	6.9	1.0	.9	.1	71.4	(2)	45.3	61	85	16.0	96	227	77	77	27.9

See footnotes at end of table.

Provisional mortality from certain causes in the first 9 months of 1943, with comparative provisional data for the corresponding period in preceding years—Continued

State and period	All causes, rate per 1,000 population (annual basis)	Births (exclusive of stillbirths) per 1,000 population (annual basis)	Rate per 1,000 live births	Death rate per 100,000 population (annual basis)																				
			Total infant mortality	Maternal mortality	Typhoid and paratyphoid fever (1–2)	Dysentery (27)	Diarrhea and enteritis under 2 years (119)	Scarlet fever (8)	Diphtheria (10)	Whooping cough (9)	Measles (35)	Cerebrospinal (meningococcus) meningitis (6)	Acute poliomyelitis and polioencephalitis (36)	Acute infectious encephalitis (lethargic) (37)	Tuberculosis, all forms (13–22)	Syphilis (30)	Influenza (grippe) (33)	Pneumonia, all forms (107–109)	Cancer, all forms (45–55)	Diabetes mellitus (61)	Intracranial lesions of vascular origin (83)	Diseases of the heart (90–95)	Nephritis, all forms (130–132)	All accidents, including automobile accidents (169–195)	Automobile accidents (170 a, b, c)
38 States—Continued																								
Louisiana:																								
1943	9.3	22.7	46	3.3	1.5	1.4	6.7	(†)	0.6	4.6	0.6	0.9	0.5	0.2	52.0	18.1	11.8	50	83	15.7	71	233	65	54	15.5
1942	9.1	20.4	53	3.6	1.8	1.6	8.0	.1	1.2	2.5	1.5	.8	.5	.2	48.6	21.1	12.1	49	82	15.6	65	216	67	47	17.6
1941	9.9	20.6	62	4.7	2.9	(*)	10.0	.2	1.0	2.0	.3	.7	.3	.1	55.9	(*)	30.1	59	83	15.5	63	244	84	70	26.6
Maine:																								
1943	13.5	24.0	49	2.3	.5	(†)	9.6	.2	.5	3.0	.3	7.3	.5	.5	32.2	8.0	17.4	65	159	28.7	144	403	99	78	13.6
1942	12.5	20.9	43	2.0	.3	.2	7.8	1.0	.3	2.3	1.8	2.6	.3	.6	32.9	6.1	10.7	53	153	29.7	128	365	82	83	19.1
1941	12.7	18.7	48	2.7	.5	(*)	9.1	.2	.3	2.1	1.3	1.3	.3	.5	31.9	(*)	23.6	57	154	32.6	125	380	93	76	23.6
Maryland:																								
1943	11.2	21.4	42	1.7	.3	.8	10.7	.2	.2	.4	.4	4.8	(†)	.4	63.9	14.9	4.1	56	126	28.3	87	334	107	71	16.0
1942	11.0	19.3	46	1.9	.4	.9	11.0	.1	.1	1.4	.8	2.3	(†)	.5	69.3	17.7	4.8	53	126	27.3	86	348	103	76	21.8
1941	11.6	18.1	53	1.9	.8	(*)	10.6	.1	(†)	4.2	.8	1.1	.2	.6	75.2	(*)	11.1	59	137	30.0	89	332	114	75	28.1
Massachusetts:																								
1943	12.7	(*)	(*)	(*)	.2	.1	4.8	.6	.2	.9	.6	3.0	.5	.2	43.0	7.0	3.3	71	175	38.5	114	456	65	70	10.1
1942	11.3	(*)	(*)	(*)	.8	.1	2.3	.3	.2	.8	.5	.8	(†)	.6	38.4	6.7	2.3	53	172	35.7	106	400	59	61	12.1
1941	11.8	(*)	(*)	(*)	.0	(*)	4.6	.3	.1	1.1	.1	.6	.0	.4	38.3	(*)	8.2	64	175	36.2	105	430	65	62	15.6
Michigan:																								
1943	10.4	23.7	38	1.9	.2	.4	5.2	.2	.3	2.2	2.0	2.2	.5	.2	35.5	11.0	6.5	50	127	27.4	97	324	54	63	16.5
1942	9.4	21.7	38	2.1	.1	.6	4.0	.5	.3	1.2	.2	2.3	.2	.3	34.2	9.9	3.3	41	115	25.4	85	283	48	68	25.4
1941	9.8	19.4	39	2.9	.2	(*)	4.4	.6	.3	1.8	1.6	.1	.3	.2	32.7	(*)	9.6	43	116	25.8	87	290	53	81	36.9
Minnesota:																								
1943	10.4	23.4	31	1.5	(†)	.1	1.8	.4	.6	1.1	.7	.7	.5	.7	29.7	7.2	5.1	49	155	28.4	107	305	42	65	10.4
1942	9.7	21.5	30	1.5	.2	.3	2.7	.2	.3	.7	.6	.3	.3	.6	25.8	6.7	7.6	47	145	26.5	94	281	43	66	17.9
1941	9.7	20.0	34	2.1	.1	(*)	2.7	.1	.3	1.1	.1	.3	1.1	3.2	29.2	(*)	11.1	48	144	25.1	82	264	40	77	22.5

Missouri:[8]																							
1943	12.4	21.9	37	2.0	.3	.7	2.8	.8	1.5	1.8	2.6	2.9	.5	.7	48.2	15.1	13.4	89	139	28.6	109	367	120	69	12.4
1942	12.1	18.9	41	2.8	.4	.5	3.3	.5	.7	1.2	2.1	.5	.3	.4	45.8	14.8	13.6	88	144	25.1	106	326	118	72	20.2
1941	12.6	20.5	43	2.3	.6	(2)	2.3	.8	1.1	5.8	5.6	.6	.3	.7	51.0	(2)	53.4	101	133	30.2	104	329	114	73	24.7
Montana:																									
1943	11.4	23.5	41	1.8	.5	1.6	4.9	.5	1.1	3.3	1.6	.5	.8	1.1	42.1	9.1	7.4	52	122	19.5	87	297	63	134	19.8
1942	10.4	22.1	37	2.1	(1)	.3	3.4	.8	1.0	2.3	1.0	1.3	(7)	1.0	38.4	11.9	6.5	47	124	14.0	100	276	60	90	21.3
1941	10.7	21.6	38	1.7	.2	(2)	4.5	1.7	2.9	1.2	.2	.2	1.0	3.5	39.8	(2)	21.2	50	116	14.7	100	257	60	104	34.8
Nebraska:																									
1943	10.4	20.4	36	1.8	(7)	.1	1.6	.7	.5	2.3	1.5	1.0	2.0	.1	16.8	8.3	11.1	40	134	31.8	100	291	77	73	14.5
1942	9.6	18.4	32	1.8	.1	.2	1.9	.4	.6	1.2	.7	.3	1.5	.3	13.7	8.0	11.1	34	138	27.0	99	273	67	67	16.8
1941	9.7	17.2	35	2.7	.2	(2)	1.4	.1	.3	2.8	.4	.6	1.0	1.6	15.9	(2)	28.5	37	128	25.5	106	241	68	65	19.3
Nevada:																									
1943	10.8	20.6	49	3.0	(7)	.9	4.4	(7)	(7)	2.6	(7)	2.6	2.6	(7)	42.2	17.6	4.4	71	79	13.2	64	267	45	177	35.1
1942	12.4	18.4	59	.5	2.0	5.9	10.8	1.0	(7)	6.9	2.0	2.0	1.0	2.0	54.1	11.8	5.9	56	104	12.8	88	314	55	206	73.4
1941	11.7	16.9	44	3.9	3.3	(2)	4.3	(7)	(7)	1.1	(7)	(7)	(7)	1.1	51.1	(2)	7.6	40	102	14.1	65	285	50	212	95.6
New Jersey:																									
1943	11.3	19.6	33	1.6	.3	.1	4.2	.3	.3	1.0	.7	3.1	.2	.5	45.6	8.2	6.4	44	144	36.9	98	392	70	63	15.4
1942	10.6	18.1	32	1.9	.1	.4	2.7	.2	.1	.9	.2	.5	.5	.5	43.7	9.3	3.2	39	150	34.3	89	357	67	62	17.3
1941	10.7	15.5	36	2.2	.2	(2)	2.9	.2	.2	.7	.8	.3	.3	.3	43.6	(2)	6.3	43	131	35.4	94	352	75	63	21.5
New Mexico:																									
1943	10.4	29.7	85	4.8	.5	14.6	44.0	.2	1.7	5.9	3.7	.7	1.2	.2	73.7	11.4	11.9	56	70	10.1	42	127	46	126	18.3
1942	9.8	26.5	94	3.9	1.0	9.1	32.3	(7)	1.5	7.6	7.8	.8	1.8	1.0	58.4	10.4	14.9	66	53	6.8	40	125	47	88	27.5
1941	10.8	28.0	97	3.8	2.3	(2)	48.9	.3	2.0	11.6	11.6	.3	.3	.5	68.6	(2)	18.7	57	54	11.8	44	120	50	100	41.8
New York:																									
1943	12.3	20.0	32	2.0	.1	.2	3.7	.3	.2	1.3	.9	2.8	.2	1.2	50.7	13.9	3.0	50	172	41.9	83	453	61	60	12.0
1942	11.3	18.0	32	2.2	.2	.2	3.1	.2	.1	1.1	.1	.8	.2	.9	45.2	14.2	1.8	40	171	40.1	75	40	57	61	15.8
1941	11.2	16.1	32	2.3	.2	(2)	2.8	.2	.1	.7	.5	.5	.3	.9	48.0	(2)	4.8	46	160	41.4	73	396	61	63	18.3
North Carolina:																									
1943	8.2	26.4	46	3.5	.6	1.6	12.2	.1	1.0	3.1	.6	1.6	.3	.1	40.0	6.8	11.0	47	63	12.1	86	171	78	60	17.3
1942	8.2	23.9	51	3.8	.5	1.8	13.3	.4	.9	3.2	2.0	.5	.3	.1	46.1	7.7	8.5	48	60	12.6	86	163	81	66	24.6
1941	9.1	24.0	61	4.5	1.0	(2)	19.7	.3	1.4	6.1	3.4	.3	.3	.4	50.5	(2)	31.9	59	61	12.9	81	164	86	70	33.5
North Dakota:																									
1943	8.6	26.2	30	2.5	.7	.2	3.2	(7)	.7	.2	.7	1.2	.2	2.2	23.4	3.9	5.2	36	110	23.4	82	232	54	59	11.3
1942	7.8	21.4	38	2.8	.2	.5	6.6	.5	.2	2.3	2.1	.2	.2	2.1	23.1	3.0	4.3	36	100	20.8	81	189	40	43	14.9
1941	8.7	22.7	39	2.5	(7)	(2)	3.9	.4	1.3	2.4	.4	(7)	.2	25.5	21.4	(2)	13.7	38	93	22.0	77	203	50	66	16.6
Ohio:																									
1943	11.6	20.7	40	2.1	.6	.3	7.5	.5	.5	2.1	.9	1.2	.2	.5	40.8	12.5	11.5	50	141	34.3	119	347	73	76	16.9
1942	10.9	19.2	39	2.0	.3	.3	6.0	.4	.2	2.1	.5	.1	.3	.2	41.2	11.7	9.0	46	135	30.9	105	315	76	81	27.2
1941	11.2	17.2	41	2.6	.3	(2)	7.0	.3	.3	2.7	2.1	.2	.7	.7	42.5	(2)	16.6	44	137	29.0	104	309	73	87	32.5
Oklahoma:																									
1943	8.8	19.8	48	2.8	1.2	2.4	5.8	.3	1.0	4.4	.2	1.9	1.5	.5	41.5	9.8	10.6	43	88	16.7	92	191	56	66	12.5
1942	9.6	22.0	41	3.7	1.6	3.2	4.7	.2	1.5	2.5	6.0	1.6	.7	.5	49.2	7.3	13.6	50	96	16.8	91	204	58	75	18.2
1941	9.0	20.1	51	2.9	1.6	(2)	4.5	.3	2.4	6.5	1.1	.4	.6	.4	47.6	(2)	28.8	54	85	15.6	80	191	58	63	21.8
Pennsylvania:																									
1943	11.4	21.4	35	1.9	.3	.4	4.3	.3	.3	2.1	.7	1.9	.2	.0	39.5	10.4	7.5	46	134	35.6	95	364	90	53	11.3
1942	10.9	20.5	36	1.4	.3	.2	3.7	.4	.1	1.3	.5	6.7	.2	.2	39.6	10.8	6.0	41	129	33.3	87	341	85	52	15.4
1941	10.9	18.4	38	2.4	.5	(2)	4.4	.3	.3	1.6	1.3	.3	.7	.7	40.2	(2)	13.0	45	125	35.2	86	342	86	58	18.3
Rhode Island:																									
1943	11.9	20.5	42	2.1	(7)	.2	7.2	.5	.4	1.6	.2	8.0	1.1	1.1	39.0	9.4	4.0	53	155	43.5	92	401	97	64	9.2
1942	10.5	18.2	40	2.2	.2	(7)	9.6	.2	.5	1.1	.7	.4	.2	.4	37.7	9.4	2.3	49	141	35.5	94	354	79	55	10.6
1941	10.9	16.0	37	2.3	(7)	(2)	2.6	.4	(7)	.2	.2	.4	.6	.4	38.0	(2)	6.8	45	148	38.6	83	380	103	50	10.1

See footnotes at end of table.

Provisional mortality from certain causes in the first 9 months of 1943, with comparative provisional data for the corresponding period in preceding years—Continued

| State and period | All causes, rate per 1,000 population (annual basis) | Births (exclusive of stillbirths) per 1,000 population (annual basis) | Rate per 1,000 live births | | Death rate per 100,000 population (annual basis) | | |

Virginia:																								
1943	8.8	21.0	49	3.0	.5	2.6	7.6	.3	.7	3.5	.4	3.4	.3	.5	43.9	12.5	10.2	47	72	14.5	90	210	78	70	16.9
1942	9.5	19.9	57	3.3	.8	3.6	11.7	.4	.8	3.3	.6	1.5	.3	.4	53.0	14.6	11.5	53	78	15.8	94	218	77	74	22.7
1941	10.8	20.0	69	4.1	.9	(2)	14.7	.3	.9	7.6	7.5	1.4	.5	.1	58.7	(2)	32.6	59	81	18.8	97	243	95	86	33.7
Washington:[9]																								
1943	11.8	20.1	40	1.8	.1	.4	2.9	.7	1.5	1.2	4.0	2.7	.6	1.6	37.8	11.4	11.2	67	123	25.7	110	372	62	94	18.4
1942	10.8	17.7	37	2.4	.1	.1	1.9	.6	.4	1.5	.3	.5	.1	1.1	37.8	12.0	8.7	52	129	27.5	111	327	67	81	24.9
1941	12.1	15.2	38	2.1	.2	(2)	.7	.1	.6	1.8	.2	.3	.2	.6	41.6	(2)	13.7	41	130	24.7	98	330	67	87	28.4
Wisconsin:																								
1943	10.4	21.6	34	2.1	.2	.3	2.8	.6	.2	1.6	1.2	1.1	.5	.7	25.8	6.3	7.5	39	143	33.5	103	319	61	68	12.4
1942	9.6	19.3	32	2.0	.0	.1	2.1	.8	.1	1.4	.3	.3	.2	.5	24.4	5.1	6.0	35	137	26.3	98	299	51	64	19.8
1941	9.7	17.5	36	2.7	.3	(2)	2.2	.6	.0	.9	.9	.1	.3	.7	25.8	(2)	12.3	38	132	28.6	91	293	54	71	25.1
Wyoming:																								
1943	8.5	21.7	35	1.2	.5	(2)	2.0	.5	(7)	.5	2.6	1.0	2.6	2.1	19.3	(2)	9.4	43	85	15.1	55	229	68	100	15.6
1942	8.6	20.4	50	3.1	(7)	(2)	3.7	1.6	.5	2.6	1.6	1.0	1.0	(7)	15.9	10.6	11.7	37	74	16.5	59	219	64	104	28.2
1941	8.9	20.0	47	3.0	1.1	(2)	3.2	.5	2.1	1.6	1.1	1.6	(7)	3.2	13.3	(2)	26.1	45	83	11.7	68	214	69	117	50.6

[1] The District of Columbia is included as a State. Includes all of the States listed below except Idaho, Washington, and Missouri.
[2] Data not available.
[3] These data are taken from the October 1943 Statistical Bulletin published by the Metropolitan Life Insurance Co. The rates for 1943 are subject to correction as they are based on provisional estimates of lives exposed to risk. Data do not include all diseases reported to the Public Health Service.
[4] Classified as diarrhea and enteritis, age not specified.
[5] International List (1940) titles 92, 93 c, d, e, 94 a, b, and 95 only.
[6] Chronic nephritis only.
[7] No deaths reported.
[8] 6 months only.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED APRIL 29, 1944

Summary

Following an increase last week, the incidence of meningococcus meningitis again declined. A total of 449 cases was reported, the smallest weekly total since December of last year, as compared with 491 last week, 592 for the corresponding week last year, and a 5-year (1939–43) median of 56. Nine States reporting 18 or more cases currently (last week's figures in parentheses) are as follows: *Increases*—Pennsylvania 34 (33), Ohio 41 (35), Michigan 23 (15), Missouri 22 (15); *decreases*—New Jersey 21 (23), Illinois 43 (53), Texas 18 (23), California 22 (23); *no change*—New York 56 (56). The peak week of incidence of this disease in past years has rarely occurred later than the middle of April. The total number of cases reported to date this year is 9,083, as compared with 8,213 for the same period last year.

The incidence of measles declined slightly during the week, while that of scarlet fever increased. Totals reported currently are 29,995 cases of measles and 7,439 of scarlet fever, 18 and 80 percent, respectively, above the corresponding medians, and, with one exception as regards measles, more than for the corresponding week of any of the past 5 years. Cumulative totals to date are 428,568 for measles and 105,596 for scarlet fever, as compared with 5-year medians of 305,155 and 67,902, respectively.

Current reports of diphtheria, influenza, smallpox, typhoid fever, and whooping cough continue below the respective median expectancies. A total of 18 cases of poliomyelitis was reported, as compared with 26 last week and a 5-year median of 17. One case of psittacosis was reported, in Pennsylvania, and 5 cases of Rocky Mountain spotted fever, all of which occurred in western States.

Deaths recorded in 93 large cities of the United States totaled 9,332, as compared with 9,288 for the preceding week and a 3-year (1941–43) average of 9,070. The cumulative total for the year is 169,772, as compared with 171,544 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended April 29, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Weekended—		Median 1939–43	Weekended—		Median 1939–43	Weekended—		Median 1939–43	Weekended—		Median 1939–43
	April 29, 1944	May 1, 1943		April 29, 1944	May 1, 1943		April 29, 1944	May 1, 1943		April 29, 1944	May 1, 1943	
NEW ENGLAND												
Maine	0	0	1	15	1	1	441	24	84	4	7	1
New Hampshire	0	0	0	3	----	----	35	54	31	0	1	0
Vermont	0	0	0	----	----	----	109	278	84	0	3	0
Massachusetts	2	4	3	----	----	----	1,017	1,688	1,190	12	30	2
Rhode Island	1	0	1	----	----	----	98	4	26	1	12	0
Connecticut	0	1	0	----	----	1	527	481	447	6	11	0
MIDDLE ATLANTIC												
New York	9	20	20	[1]3	[1]8	[1]12	1,836	3,145	1,705	56	76	4
New Jersey	5	4	5	2	13	10	1,505	2,485	817	21	47	2
Pennsylvania [2]	9	18	18	2	2	----	956	2,010	1,297	34	36	7
EAST NORTH CENTRAL												
Ohio	4	10	8	19	19	12	698	568	380	41	17	1
Indiana	5	6	6	5	2	11	198	688	148	12	12	0
Illinois	6	22	22	7	13	12	918	1,900	620	43	29	3
Michigan [3]	8	7	2	5	1	14	1,078	2,603	674	23	23	0
Wisconsin	4	1	1	61	26	52	2,816	1,703	1,183	9	15	1
WEST NORTH CENTRAL												
Minnesota	3	3	3	----	4	4	804	322	322	1	6	0
Iowa	2	2	3	10	----	1	212	334	273	6	1	0
Missouri	0	1	1	1	3	3	308	276	276	22	22	2
North Dakota	1	0	1	1	4	9	70	67	45	0	1	0
South Dakota	1	0	0	----	----	1	30	104	20	0	0	0
Nebraska	0	1	3	3	7	7	255	270	270	2	1	0
Kansas	1	3	6	7	2	7	723	532	616	9	8	0
SOUTH ATLANTIC												
Delaware	0	0	0	----	----	----	15	110	13	2	3	0
Maryland [2]	20	6	3	4	10	10	609	327	348	6	22	2
District of Columbia	0	0	0	2	1	----	229	132	132	4	5	2
Virginia	2	2	8	108	221	221	613	381	381	10	26	1
West Virginia	2	0	2	13	9	15	446	133	78	4	5	2
North Carolina	6	4	5	1	7	14	1,701	321	686	5	15	1
South Carolina	6	4	4	267	387	328	371	63	63	4	13	1
Georgia	3	1	6	5	29	29	79	352	211	10	7	0
Florida	7	3	3	14	15	9	289	67	107	2	7	0
EAST SOUTH CENTRAL												
Kentucky	3	2	5	3	8	8	169	309	142	12	16	2
Tennessee	3	2	3	28	29	60	232	376	168	14	7	2
Alabama	9	7	7	45	149	93	323	141	178	6	8	3
Mississippi [3]	5	5	5	----	----	----	----	----	----	5	7	1
WEST SOUTH CENTRAL												
Arkansas	3	4	4	52	39	92	241	152	133	2	1	1
Louisiana	2	1	6	4	1	3	102	48	67	8	2	1
Oklahoma	5	8	2	90	32	76	382	42	184	2	2	2
Texas	29	20	22	711	721	721	4,182	739	1,260	18	21	2
MOUNTAIN												
Montana	0	2	2	12	22	14	115	197	158	1	0	0
Idaho	0	0	0	----	2	1	33	209	37	0	4	0
Wyoming	0	0	0	----	2	1	67	187	86	1	0	0
Colorado	13	12	9	22	27	14	246	748	445	2	4	0
New Mexico	2	0	1	7	5	1	111	12	30	0	0	0
Arizona	3	0	0	58	88	88	322	83	89	0	3	0
Utah	0	0	1	----	5	7	44	154	154	0	5	0
Nevada	0	0	0	100	----	----	19	33	0	1	0	0
PACIFIC												
Washington	1	6	1	----	3	----	256	458	458	5	8	0
Oregon	3	4	4	20	35	17	163	362	362	1	9	0
California	23	15	15	24	80	81	4,002	854	854	22	34	2
Total	211	211	237	1,734	2,032	2,032	29,995	26,526	25,479	449	592	56
17 weeks	3,994	4,551	4,878	328,181	68,336	138,406	428,568	314,834	305,155	9,083	8,213	854

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended April 29, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[4]		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	April 29, 1944	May 1, 1943		April 29, 1944	May 1, 1943		April 29, 1944	May 1, 1943		April 29, 1944	May 1, 1943	
NEW ENGLAND												
Maine	0	0	0	73	23	12	0	0	0	2	0	0
New Hampshire	0	0	0	20	7	2	0	0	0	0	0	0
Vermont	0	0	0	10	6	7	0	0	0	1	0	0
Massachusetts	1	0	0	426	547	222	0	0	0	2	32	8
Rhode Island	0	0	0	11	39	15	0	0	0	1	0	0
Connecticut	1	0	0	102	124	93	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York	0	3	0	577	595	538	0	0	0	3	4	8
New Jersey	0	0	0	359	173	236	0	0	0	3	0	0
Pennsylvania[3]	0	2	1	844	282	393	0	0	0	1	3	7
EAST NORTH CENTRAL												
Ohio	0	0	0	588	317	317	0	13	0	1	1	3
Indiana	0	1	0	131	127	127	2	3	3	2	2	1
Illinois	1	3	0	495	239	313	0	2	2	1	0	2
Michigan[3]	0	0	0	404	133	250	1	0	0	2	1	2
Wisconsin	1	0	0	394	366	171	0	1	1	1	0	0
WEST NORTH CENTRAL												
Minnesota	0	0	0	172	48	72	0	0	3	0	0	1
Iowa	0	0	0	117	44	50	0	1	6	1	0	1
Missouri	0	0	0	170	48	73	0	0	3	3	5	1
North Dakota	0	0	0	49	3	9	0	0	0	0	0	0
South Dakota	0	0	0	16	8	15	2	0	0	0	0	0
Nebraska	1	0	0	125	32	19	0	2	0	0	0	0
Kansas	1	1	0	122	53	68	0	1	0	1	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	18	6	11	0	0	0	0	0	0
Maryland[3]	0	0	0	222	164	48	0	0	0	2	3	2
District of Columbia	0	0	0	145	20	18	0	0	0	0	0	0
Virginia	1	0	0	64	57	31	0	0	0	5	2	2
West Virginia	0	0	0	93	26	39	0	0	0	1	3	2
North Carolina	0	0	0	37	25	25	0	0	0	2	2	2
South Carolina	0	0	0	2	9	2	0	0	0	1	1	2
Georgia	0	0	0	43	12	12	0	0	0	8	2	2
Florida	0	0	0	9	10	6	0	0	0	2	2	1
EAST SOUTH CENTRAL												
Kentucky	0	2	0	83	49	54	1	0	0	0	1	2
Tennessee	1	0	0	96	27	53	0	0	0	3	1	1
Alabama	0	1	2	19	2	12	0	1	1	3	1	1
Mississippi[3]	1	0	0	2	7	7	0	2	0	1	3	3
WEST SOUTH CENTRAL												
Arkansas	0	0	0	11	24	6	0	0	2	3	1	1
Louisiana	4	0	0	12	9	5	1	0	0	3	1	7
Oklahoma	0	0	0	22	15	12	0	0	1	2	0	0
Texas	2	5	2	225	62	37	1	4	4	4	8	6
MOUNTAIN												
Montana	0	0	0	39	5	18	0	0	0	0	0	0
Idaho	0	0	0	54	42	7	0	0	0	0	1	1
Wyoming	0	0	0	13	29	8	0	0	0	0	0	0
Colorado	0	0	0	44	84	34	0	4	0	2	13	0
New Mexico	0	0	0	18	7	7	0	0	0	0	0	0
Arizona	0	1	0	27	4	6	0	0	0	0	0	1
Utah	0	1	0	79	19	13	0	0	0	0	0	0
Nevada	0	0	0	3	0	0	0	0	0	0	0	0
PACIFIC												
Washington	0	1	0	334	44	35	1	0	0	0	1	0
Oregon	0	0	0	153	16	13	0	1	1	0	2	1
California	3	7	3	367	116	133	0	0	0	9	1	3
Total	18	28	17	7,439	4,104	4,104	9	35	46	77	97	91
17 weeks	375	429	401	105,596	67,902	67,902	198	459	752	1,223	979	1,305

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended April 29, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough			Week ended April 29, 1944								
	Week ended—		Median 1939–43	Anthrax	Dysentery			Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
	April 29, 1944	May 1, 1943			Amebic	Bacillary	Unspecified					
NEW ENGLAND												
Maine	18	48	19	0	0	0	0	0	0	0	0	0
New Hampshire	3	2	2	0	0	0	0	0	0	0	0	0
Vermont	13	23	23	0	0	0	0	0	0	0	0	0
Massachusetts	96	140	215	0	0	0	0	0	0	0	0	0
Rhode Island	8	28	28	0	0	0	0	0	0	0	0	0
Connecticut	11	50	70	0	0	0	0	1	0	0	0	0
MIDDLE ATLANTIC												
New York	100	196	348	0	0	3	0	1	0	0	0	0
New Jersey	58	187	187	0	0	0	0	0	0	0	0	0
Pennsylvania [2]	103	243	246	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	59	190	229	0	1	0	0	2	0	0	0	0
Indiana	5	95	60	0	0	0	10	0	0	0	0	0
Illinois	21	126	126	0	2	0	0	1	0	0	0	0
Michigan [3]	65	227	196	0	0	1	0	0	0	0	0	0
Wisconsin	50	209	170	0	1	0	0	1	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	23	104	44	0	3	0	0	0	0	0	0	0
Iowa	20	51	29	0	0	0	0	0	0	0	0	0
Missouri	8	24	16	0	0	0	1	1	0	0	0	0
North Dakota	2	1	5	0	0	0	0	0	0	0	0	0
South Dakota	2	8	4	0	0	0	0	0	0	0	0	0
Nebraska	18	22	16	0	0	0	0	0	0	0	0	0
Kansas	40	77	43	0	0	0	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	1	5	0	0	0	0	0	0	0	0	0
Maryland [3]	22	123	112	0	0	0	4	0	0	0	0	0
District of Columbia	5	33	27	0	0	0	0	0	0	0	0	0
Virginia	62	104	79	0	0	0	45	0	0	0	0	1
West Virginia	6	48	35	0	0	0	0	0	0	0	0	0
North Carolina	159	185	185	0	0	0	0	0	0	0	0	0
South Carolina	73	58	81	0	0	10	0	0	0	0	0	1
Georgia	12	50	28	0	2	4	0	0	0	0	1	10
Florida	16	44	32	0	0	0	0	1	0	0	0	1
EAST SOUTH CENTRAL												
Kentucky	43	22	84	0	0	0	0	0	0	0	0	0
Tennessee	26	69	42	0	1	0	0	0	0	0	0	0
Alabama	10	66	39	0	3	0	0	4	0	0	0	5
Mississippi [3]				0	0	0	0	0	0	0	3	1
WEST SOUTH CENTRAL												
Arkansas	41	39	33	0	0	11	0	0	0	0	1	0
Louisiana	0	6	12	0	0	11	0	0	0	0	1	4
Oklahoma	1	36	36	0	0	0	0	0	0	0	0	0
Texas	316	602	318	0	7	276	0	6	0	0	3	23
MOUNTAIN												
Montana	4	5	5	0	0	0	0	0	0	1	0	0
Idaho	2	1	4	0	0	0	0	0	0	0	0	0
Wyoming	5	0	1	0	0	0	0	0	0	3	0	0
Colorado	25	35	35	0	0	0	0	0	0	0	0	0
New Mexico	17	39	39	0	0	0	0	0	0	0	0	0
Arizona	15	19	24	0	0	0	47	0	0	0	0	0
Utah	47	72	57	0	0	0	0	0	0	0	0	0
Nevada	2	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	33	45	56	0	0	0	0	0	0	0	0	0
Oregon	30	14	20	0	0	0	0	0	0	1	0	0
California	98	320	375	0	1	7	0	2	0	0	0	0
Total	1,793	4,081	3,889	0	21	323	107	21	0	5	9	46
17 weeks	30,707	68,264	68,264	17	449	3,668	1,130	189	9	12	172	650
17 weeks, 1943				25	10	3,288	782	189	8	26	284	789

[1] New York City only. [2] Psittacosis: 1 case in Pennsylvania. [3] Period ended earlier than Saturday.
[4] Including paratyphoid fever cases reported separately as follows: Rhode Island 1, New York 1, Texas 1, Colorado 1. West Virginia reports of typhoid fever through March and April include 5 cases of paratyphoid fever.

WEEKLY REPORTS FROM CITIES

City reports for week ended April 15, 1944

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	1	-----	0	27	2	1	0	14	0	0	0
New Hampshire:												
Concord	0	0	-----	0	0	0	0	0	2	0	0	0
Vermont:												
Barre	0	0	-----	0	0	0	0	0	1	0	0	0
Massachusetts:												
Boston	4	0	-----	0	209	5	25	0	108	0	0	14
Fall River	0	0	-----	0	24	0	0	0	2	0	0	2
Springfield	0	0	-----	0	23	1	0	0	22	0	0	6
Worcester	0	0	-----	0	0	0	8	0	51	0	0	2
Rhode Island:												
Providence	0	0	2	0	174	1	5	0	10	0	0	1
Connecticut:												
Bridgeport	0	0	-----	0	22	1	1	0	4	0	0	0
Hartford	0	0	-----	0	10	0	3	0	26	0	0	3
New Haven	0	0	-----	0	154	0	1	0	1	0	0	7
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	-----	1	3	2	10	0	11	0	0	0
New York	6	0	2	2	1,408	27	75	2	286	0	2	25
Rochester	0	0	-----	0	6	3	1	0	4	0	0	0
Syracuse	0	0	-----	0	15	0	2	0	13	0	1	18
New Jersey:												
Camden	1	0	-----	0	0	0	2	0	40	0	0	0
Newark	0	0	-----	2	300	4	5	0	17	0	0	7
Trenton	0	0	-----	0	1	0	3	0	10	0	0	0
Pennsylvania:												
Philadelphia	3	1	2	-----	54	13	42	0	114	0	0	4
Pittsburgh	0	0	1	1	40	6	28	0	35	0	0	6
Reading	0	0	-----	0	2	0	5	0	3	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	2	0	-----	2	44	4	1	0	64	0	0	8
Cleveland	0	0	2	0	147	10	15	0	90	0	1	8
Columbus	0	0	2	2	96	2	2	0	11	0	0	10
Indiana:												
Fort Wayne	0	0	-----	0	0	0	0	0	2	0	0	0
Indianapolis	0	0	-----	2	69	3	5	0	47	0	1	3
South Bend	0	0	-----	0	3	0	0	0	4	0	0	0
Terre Haute	0	0	-----	0	2	1	1	0	1	0	0	0
Illinois:												
Chicago	2	0	3	4	130	25	34	0	203	0	1	22
Springfield	0	0	-----	0	41	0	3	0	3	0	0	1
Michigan:												
Detroit	4	0	-----	0	123	12	21	0	137	0	0	15
Flint	0	0	-----	0	8	1	2	0	6	0	0	0
Grand Rapids	0	0	-----	0	45	0	2	0	12	0	0	0
Wisconsin:												
Kenosha	0	0	-----	0	115	0	0	0	0	0	0	0
Milwaukee	1	0	-----	0	166	3	3	0	59	0	0	15
Racine	0	0	-----	0	25	0	0	0	4	0	0	1
Superior	0	0	-----	0	3	0	0	0	34	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	-----	0	69	0	1	0	24	0	0	3
Minneapolis	0	0	-----	2	328	4	7	1	39	0	0	3
St. Paul	0	0	-----	1	420	2	6	0	29	0	0	0
Missouri:												
Kansas City	0	0	-----	0	117	3	6	0	38	0	0	0
St. Joseph	0	0	-----	0	1	0	0	0	7	0	0	0
St. Louis	0	0	1	0	112	9	7	0	45	0	0	9
Nebraska:												
Omaha	2	0	-----	0	63	0	6	0	31	0	0	0
Kansas:												
Topeka	0	0	-----	0	49	0	0	0	6	0	0	3
Wichita	0	0	-----	0	48	0	3	0	8	0	0	2

City reports for week ended April 15, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
SOUTH ATLANTIC												
Delaware:												
Wilmington	1	0	------	0	2	0	1	0	1	0	0	0
Maryland:												
Baltimore	5	0	3	3	650	6	16	0	92	0	0	21
Cumberland	0	0	------	0	0	0	0	0	0	0	0	0
Frederick	0	0	------	0	3	0	0	0	5	0	0	0
District of Columbia:												
Washington	0	0	------	0	195	2	6	0	135	0	0	3
Virginia:												
Lynchburg	0	0	------	0	3	0	2	0	0	0	0	0
Richmond	0	0	------	0	105	1	2	0	6	0	0	1
Roanoke	0	0	------	0	25	0	0	0	2	0	0	4
West Virginia:												
Charleston	0	0	------	0	2	0	0	0	9	0	0	0
Wheeling	0	0	------	0	0	0	4	0	0	0	0	0
North Carolina:												
Winston-Salem	0	0	------	0	21	0	1	0	0	0	0	1
South Carolina:												
Charleston	0	0	4	0	29	1	0	0	0	0	0	0
Georgia:												
Atlanta	0	0	25	1	18	1	2	0	6	0	1	1
Brunswick	0	0	------	0	4	1	4	0	0	0	0	0
Savannah	0	0	1	1	11	0	1	0	0	0	0	0
Florida:												
Tampa	0	0	------	0	6	1	0	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	2	0	51	8	6	0	45	0	0	9
Nashville	1	0	------	1	12	1	5	0	9	0	0	1
Alabama:												
Birmingham	1	0	5	0	27	0	5	0	5	0	0	0
Mobile	0	0	------	1	4	4	2	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	1	49	0	0	0	1	0	0	0
Louisiana:												
New Orleans	0	0	3	0	30	6	2	0	7	0	1	0
Shreveport	0	0	------	0	0	0	4	0	1	0	1	0
Texas:												
Dallas	2	0	------	0	198	3	3	0	5	0	0	0
Galveston	1	0	------	0	250	0	3	0	2	0	0	0
Houston	1	0	------	0	27	0	8	0	2	0	0	0
San Antonio	1	0	1	1	18	1	10	0	3	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0	------	0	9	0	0	0	2	0	0	0
Great Falls	2	0	------	0	23	1	2	0	6	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	7	0	0	0	3	0	0	0
Idaho:												
Boise	0	0	------	0	3	0	0	0	2	0	0	0
Colorado:												
Denver	1	0	6	1	120	1	2	0	21	0	0	14
Pueblo	0	0	------	0	13	0	1	0	3	0	0	3
Utah:												
Salt Lake City	0	0	------	0	4	0	1	0	21	0	0	1
PACIFIC												
Washington:												
Seattle	0	0	------	0	43	0	10	0	64	0	0	8
Spokane	0	0	------	0	36	0	2	0	0	0	0	0
Tacoma	0	0	------	0	8	0	0	0	45	0	0	0
California:							[3]					
Los Angeles	7	0	7	1	364	6	3	1	23	0	0	8
Sacramento	0	0	------	0	0	0	1	0	2	0	0	6
San Francisco	1	0	3	0	102	2	5	1	30	0	0	6
Total	49	2	75	30	7,168	190	456	5	2,236	0	9	286
Corresponding week, 1943	49	3	126	46	8,496	207	527	3	1,742	1	12	1,168
Average, 1939–43	73	------	222	[1] 36	[2] 5,995	------	[1] 445	------	1,540	5	16	1,121

[1] 3-year average, 1941–43. [2] 5-year median.

Dysentery, amebic.—Cases: Philadelphia, 2; Chicago, 1.
Dysentery, bacillary.—Cases: Providence, 1; New York, 5; Chicago, 1; Charleston, S. C., 4; Los Angeles, 3.
Dysentery, unspecified.—Cases: San Antonio, 2.
Typhus fever.—Cases: Houston, 1; San Antonio, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1942, 34,648,700)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	10.0	2.5	5.0	0.0	1,602	24.9	109.6	0.0	600	0.0	0.0	87
Middle Atlantic	4.5	0.4	2.2	2.7	818	24.6	77.4	0.9	238	0.0	1.3	27
East North Central	5.3	0.0	4.1	5.9	595	35.7	52.1	0.0	396	0.0	1.8	49
West North Central	4.0	0.0	2.0	5.9	2,394	35.7	71.4	2.0	450	0.0	0.0	40
South Atlantic	10.4	0.0	57.4	8.7	1,869	22.6	67.9	0.0	445	0.0	1.7	54
East South Central	11.9	0.0	41.7	11.9	560	77.4	107.2	0.0	351	0.0	0.0	60
West South Central	14.7	0.0	11.8	5.9	1,682	29.4	88.2	0.0	62	0.0	5.9	0
Mountain	24.2	0.0	48.4	8.1	1,443	16.1	48.4	0.0	468	0.0	0.0	145
Pacific	14.0	0.0	17.5	1.8	969	14.0	36.8	3.5	287	0.0	0.0	49
Total	7.4	0.3	11.3	4.5	1,082	28.7	68.8	0.8	337	0.0	1.4	43

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended March 25, 1944.—During the 4 weeks ended March 25, 1944, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Measles	4
Chickenpox	53	Ophthalmia neonatorum	2
Diphtheria	42	Pellagra	1
Dysentery	12	Poliomyelitis	1
Erysipelas	1	Syphilis	900
Filariasis	21	Tetanus	6
German measles	11	Tetanus, infantile	4
Gonorrhea	455	Tuberculosis (all forms)	559
Influenza	239	Typhoid fever	26
Lymphogranuloma inguinale	9	Typhus fever, endemic	9
Malaria	1,333	Whooping cough	94

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended April 1, 1944.—During the week ended April 1, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		30		136	402	56	30	78	138	870
Diphtheria		8	5	19		3	1	5	2	43
German measles		5		115	109	10	40	22	45	346
Influenza		23			44	1	2		11	81
Measles		97	1	884	734	268	79	186	41	2,290
Meningitis, meningococcus		1			3	1	1		8	14
Mumps		5	1	185	331	94	15	70	52	753
Poliomyelitis								1		1
Scarlet fever		8	15	107	283	94	35	104	107	753
Tuberculosis (all forms)			3	206	48	8		10	46	321
Typhoid and paratyphoid fever				37	4			10	1	52
Undulant fever				3					2	5
Whooping cough		27		85	56	1	3	49	21	242

NOTE.—No report was received from Prince Edward Island for this period.

GREAT BRITAIN

England and Wales—Infectious diseases—4 weeks ended January 29, 1944.—During the 4 weeks ended January 29, 1944, cases of certain infectious diseases were reported in England and Wales as follows:

Disease	Cases	Disease	Cases
Cerebrospinal fever	286	Pneumonia	5,129
Diphtheria	2,826	Puerperal pyrexia and puerperal sepsis	655
Dysentery	664	Scarlet fever	7,603
Measles	2,744	Typhoid fever	9
Ophthalmia neonatorum	275	Whooping cough	8,150
Paratyphoid fever	14		

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

Bolivia.—Chuquisaca Department—Arrayan.—For the month of March 1944, 4 cases of plague with 3 deaths were reported in Arrayan, Chuquisaca Department, Bolivia.

Egypt.—Plague has been reported in Egypt as follows: Ismailiya (port), April 1–7, 1944, 3 cases, 2 deaths; Ismailiya District—April 1–7, 1944, 8 cases, April 8–14, 1944, 20 cases, 7 deaths, including 8 cases reported in the southern part of the district.

Indochina.—For the period March 11–20, 1944, 1 case of plague was reported in Annam, and 3 cases were reported in Laos, Indochina.

Smallpox

Algeria.—For the period March 11–20, 1944, 34 cases of smallpox were reported in Algeria.

Bolivia.—For the month of March 1944, smallpox was reported in Bolivia by Departments as follows: Pa Paz, 25 cases, 10 deaths; Potosi, 7 cases, 1 death; Oruro, 6 cases.

French Guinea.—For the period March 11–20, 1944, 26 cases of smallpox with 4 deaths were reported in French Guinea.

Indochina.—For the period March 11–20, 1944, 70 cases of smallpox were reported in Indochina.

Ivory Coast.—For the period March 11–20, 1944, 41 cases of smallpox with 3 deaths were reported in Ivory Coast.

Niger Territory.—For the period March 11–20, 1944, 34 cases of smallpox with 4 deaths were reported in Niger Territory.

Sudan (French).—For the period March 11–20, 1944, 57 cases of smallpox with 3 deaths were reported in French Sudan.

Turkey.—For the month of February 1944, 2,456 cases of smallpox were reported in Turkey.

Typhus Fever

Algeria.—For the period March 11–20, 1944, 29 cases of typhus fever were reported in Algeria.

Bolivia.—For the month of March 1944, 16 cases of typhus fever with 5 deaths were reported in Bolivia by Departments as follows: Chuquisaca, 1 death; La Paz, 15 cases, 4 deaths; Oruro, 1 case.

Ecuador.—During the month of March 1944, 48 cases of typhus fever with 4 deaths were reported in Ecuador as follows: Ambato,

Tungurahua Province, 12 cases, 1 death; Azogues, Canar Province, 1 case; Guayaquil, Guayas, 1 case; Libertad, Guayas County, 1 case; Quito, Pichincha Province, 32 cases, 2 deaths; Riobamba, Chimborazo Province, 1 case, 1 death.

France—Paris.—For the period March 12–18, 1944, 2 imported cases of typhus fever were reported in Paris, France.

Guatemala.—An outbreak of typhus fever is reported to have occurred in the Insane Asylum of Guatemala City, Guatemala, during the middle of March 1944. On April 12, 1944, 92 cases were isolated in this institution. All sanitary precautions have been taken, and the outbreak appears to be abating.

Hungary.—For the 2 weeks ended March 25, 1944, 182 cases of typhus fever were reported in Hungary. For the week ended April 1, 1944, 151 cases were reported.

Morocco (Spanish)—Mellila.—For the week ended March 18, 1944, 3 cases of typhus fever were reported in Mellila, Spanish Morocco.

Salvador—San Salvador.—During the month of March 1944, 2 cases of typhus fever were reported in San Salvador, Salvador.

Spain.—For the 2 weeks ended March 18, 1944, 43 cases of typhus fever were reported in Spain.

Turkey.—For the month of February 1944, 334 cases of typhus fever were reported in Turkey.

Venezuela.—For the month of February 1944, typhus fever was reported in Venezuela as follows: Maracay, Araguay State, 1 case; Porlamar, Sucre State, 1 case; San Fernando, Apure State, 1 case; Tinaquillo, Cojedes State, 1 case; Valera, Trujillo State, 1 case.

COURT DECISION ON PUBLIC HEALTH

Liability of city for noxious odors from sewage disposal plant.—(Iowa Supreme Court; *Duncanson* v. *City of Fort Dodge*, 11 N.W.2d 583; decided November 16, 1943.) A home owner brought an action for damages against the city of Fort Dodge because of alleged serious inconvenience and discomfort caused by nauseating odors from the city's sewage disposal plant. In deciding adversely to one of the defendant's contentions the Supreme Court of Iowa took the view that a verdict for the plaintiff could be based on evidence of inconvenience and discomfort suffered by himself and his family by reason of noxious odors produced by the nuisance even though there was no evidence of any expense connected with any sickness or discomfort.

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SOCIAL SCIENCES